

# Presentation and prognosis of female acute urinary retention: Analysis of an unusual clinical condition in outpatients

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## Abstract

**Objectives:** Acute urinary retention (AUR) in females is a poorly defined condition with undetermined epidemiology. This study aimed to evaluate female AUR in an outpatient population.

**Patients and Methods:** One hundred and thirty-eight adult female outpatients who presented to the emergency room with symptoms of urinary retention were retrospectively analyzed. The women who were ultimately diagnosed with true, complete AUR were systematically reviewed for clinical characteristics and management.

**Results:** In this outpatient cohort with urinary retention complaints, only 23% of the patients were diagnosed with objective AUR. Detailed medical and urological history in addition to urogenital, neurological, and pelvic examinations was essential; urine analysis and pelvic ultrasonography were necessary as baseline investigations. Further radiological and urodynamic tests were required in a minority. Specific etiology was established in 77% of the patients, whereas there was more than one probable cause in 16% of the patients, and no specific cause was found in 6.5% of the patients. Bladder decompression and correction of the underlying cause helped 92.6% of the reviewed patients to eventually achieve spontaneous micturition.

**Conclusions:** The proportion of true, complete AUR among female outpatients presenting to the emergency department was 23% following urological evaluation. Acute condition was resolved by urgent catheterization in all, and the majority of women had eventually resumed spontaneous voiding.

**Key Words:** Acute urinary retention, female, urethral catheterization, voiding dysfunction

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**Received:** 17.06.2016, **Accepted:** 22.08.2016

## INTRODUCTION

The epidemiology and clinical features of acute urinary retention (AUR) in females have not been well documented. A former study has estimated that female AUR occurs

1 in 100,000 every year, and female-to-male incidence rate is 1:13.<sup>[1]</sup> There is another study that is frequently cited reports on the incidence of AUR as 0.07/1000 inhabitants per year, with

Access this article online	
Quick Response Code:	Website: www.urologyannals.com
	DOI: 10.4103/0974-7796.192111

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**How to cite this article:** Özveren B, Keskin S. Presentation and prognosis of female acute urinary retention: Analysis of an unusual clinical condition in outpatients. *Urol Ann* 2016;8:444-8.

half of the cases occurring after surgery or parturition.<sup>[2]</sup> The etiology of acute disability to empty the bladder is multifactorial including anatomic or functional bladder outlet obstruction and bladder dysfunction. In females, however, urinary retention is a more complex issue than its counterpart in males. The obstructive complaints may be associated with a myriad of conditions such as infections, overactive bladder, chronic retention, dehydration, or even psychological conditions.<sup>[4]</sup> The condition is empirically regarded as transient and may easily be attributed to a particular triggering cause such as in cases of postpartum or postoperative retention.<sup>[3,4]</sup> On the other hand, the complaints of some women suggesting “urinary retention” may not necessarily indicate true, complete AUR such as in mimicking cases of urinary infections, lower ureter stones, and dehydration. The International Continence Society (ICS) defines AUR as “a painful, palpable, or percussible bladder, when the patient is unable to pass any urine.”<sup>[5]</sup>

Literature on the evaluation of symptomatic female AUR in an emergency outpatient setting is lacking. Most studies mention AUR after anti-incontinence surgeries or at early postpartum period.<sup>[1,2]</sup> Our investigation focuses on the female outpatient population and acute presentation with urinary retention. We aimed to investigate the etiological factors, clinical characteristics, diagnostic assessment, and management of female patients who presented to the emergency clinic with complaints of inability to urinate and referred to urology department for the evaluation of AUR.

## PATIENTS AND METHODS

The electronic records of adult female patients who presented to the emergency department with the International Classification of Diseases, 10<sup>th</sup> revision-coded diagnoses of “R33 - retention of urine” or “R39.1 - other difficulties with micturition” from 2000 to 2015 were reviewed in this retrospective descriptive study. Ethical approval was attained from the Local Institutional Committee with assurance of confidentiality of the data. All female outpatients who presented to the emergency room with symptoms of urinary retention and consulted by a urology specialist were included in this analysis. The patients complaining of “urinary retention” but whose symptoms or findings did not meet the requirements of clinical AUR were excluded from this analysis. Those who were finally diagnosed with AUR and therefore needed urgent catheterization were systematically chart-reviewed for the clinical characteristics, diagnostic and treatment procedures.

## RESULTS

A total of 138 referred patients were assessed for urgent complaints of “inability to urinate or empty the bladder and

suprapubic/lower abdominal pain or fullness” following initial assessment in the emergency room. Differential diagnostic evaluation determined that 107 patients did not meet the criteria for complete AUR. Even though these patients had some form of acute micturition difficulty, they did not have a high volume of retained urine or absolute inability to void. A diagnosis of AUR was reached by physical findings and radiological demonstration of residual urine. Retention of urine was verified either by abdominal ultrasonography or BladderScan<sup>®</sup> measurement.

The mean age of women was 54 (range 25–94). There were nine patients over the age of 65, whereas 11 were younger than 40 years.

Detailed urological evaluation and radiological investigations consequently confirmed AUR in 31 patients (23%) of all presented to the emergency room with subjective inability to void. These cases comprised seven patients in their early postoperative period (two orthopedic surgeries, one abdominoplasty, and four anti-incontinence operations). In addition, there were two postpartum women who visited the emergency room for urinary retention. Table I displays data of the remaining 22 cases of complete AUR (postoperative and postpartum cases are omitted). In all, specific etiology could not be distinguished in two patients (6.5%). Apparently, there was more than one probable cause in five (16%) patients.

Hypertension and diabetes mellitus were the most frequent diseases encountered in medical history of the patients. Nine (40.9%) had a diagnosis of hypertension, including four having diabetes as well. Among patients with a history of diabetes, only 1 [number 21 in Table I] had uncontrolled hyperglycemia at the time of AUR diagnosis. Medical history was not remarkable in 12 (54.6%) women.

All AUR patients, except two, were initially managed by urethral catheterization. The exceptions were one patient (cauda equina syndrome [CES] due to thoracic spinal arteriovenous malformation) who refused catheterization and another (urethral meatal stenosis) who required urethral dilatation before catheterization. Six patients (one pelvic organ prolapse, one uterine neoplasm, one idiopathic, and three postoperative) were managed by single intermittent catheterization. In addition, two patients (one pregnancy and one genital herpes simplex virus infection) agreed to drain the bladder by regular self-clean intermittent catheterization (CIC) after initial decompression. Twenty-three patients (74.2%) were catheterized for at least 1 day (range 1–14 days). Of these, four patients were discharged with their catheter, but the information on their catheterization interval could not be retrieved from the electronic records.

**Table 1: Clinical data of patients with acute urinary retention, excluding postoperative, and postpartum patients**

Patient	Age	Etiology	Residual volume (ml)	Prognosis
1	35	CES (lumbar disc hernia)	800	CIC
2	81	Urinary infection; delirium; antipsychotic medications	600	Spontaneous voiding
3	42	Idiopathic, postponed voiding (?)	550	Spontaneous voiding
4	82	Pelvic organ prolapse (Grade 3*)	500	Chronic urinary retention; urinary incontinence
5	89	Immobilization; geriatric	700	N/A
6	43	Uterine neoplasm	1800	N/A
7	81	Pelvic organ prolapse (Grade 4*); Antipsychotic medications	370	N/A
8	60	CES (thoracic spinal arteriovenous malformation)	400	Spontaneous voiding
9	38	Pregnancy (14 weeks)	2000	Spontaneous voiding
10	85	Immobilization (prosthetic infection after total hip replacement)	800	N/A
11	86	Herpes zoster infection (pelvic region)	1100	Spontaneous voiding
12	59	Uterine neoplasm	550	Spontaneous voiding
13	35	Pregnancy (14 weeks); urinary infection	700	Spontaneous voiding
14	25	Idiopathic	1200	Spontaneous voiding
15	42	Pregnancy (16 weeks)	450	Spontaneous voiding
16	31	Herpes simplex infection (genital)	300	Spontaneous voiding
17	47	Uterine neoplasm	1500	Spontaneous voiding
18	94	Syncope (paroxysmal atrial fibrillation); geriatric (?)	400	Spontaneous voiding
19	61	Urethral meatal stenosis	220	Spontaneous voiding
20	37	Ovarian neoplasm	1000	Spontaneous voiding
21	72	Ischium-pubis fracture	250	Spontaneous voiding + intermittent catheterizations
22	38	Pelvic fracture	600	Spontaneous voiding

\*POPQ: pelvic organ prolapse classification system. AUR: Acute urinary retention, CES: Cauda equina syndrome, CIC: Clean intermittent catheterization, N/A: Information on final prognosis unavailable from patient records

The average volume of urine drained by immediate catheterization was 746 ml (range 220–2000, median 600 ml). Among all patients who were unable to void spontaneously, nine patients had drained volumes of <500 ml.

Urodynamic studies were conducted in four women (12.9%). Those patients were two with CES, one with large ovarian neoplasm who had 1000 residual urine, and one with ischium-pubis fracture who later had recurrent AUR episodes and catheterizations. Cystometric studies revealed large (>600 ml) capacity, over-compliant, and hypocontractile with reduced or absent sensation bladders in three women while the patient with ischium-pubis fracture had a 370 ml capacity bladder with decreased compliance and terminal detrusor overactivity. One young patient [number 14 in Table 1] refused further urodynamic investigation when resumed voiding spontaneously following 1 day-long catheterization. The clinical presentation of this patient was suggestive of Fowler's Syndrome, however the diagnosis remained undefined due to lack of cystometric and sphincter electromyogram (EMG) studies.

The prognosis of micturition was ascertained from patient records in 27 women. Four patients were lost to follow-up. One patient who had a diagnosis of CES due to herniated lumbar disc continued with self-CIC after surgery. One patient, an 82-year-old woman with Grade 3<sup>[5]</sup> pelvic organ prolapse,

refused definitive treatment by surgery. Her later records revealed that she was followed up with a diagnosis of chronic retention and urinary incontinence. In total, 92.6% (25/27) of the female AUR patients achieved spontaneous micturition following specific treatment or catheter removal.

## DISCUSSION

The current investigation attempted to elucidate “true” AUR among female outpatients presenting to the emergency clinic with symptoms of inability to void. In this cohort of women with urgent complaints suggesting urinary retention, we observed that only 23% were diagnosed with objective AUR after urological evaluation. While the emergency medical condition was taken care by immediate urethral catheterization, majority of them ultimately achieved spontaneous micturition.

Female AUR is an uncommon clinical condition which is usually transient and also clinically ill-defined in some cases. A patient-observed situation of “inability to pass urine” may not necessarily indicate a clinically defined “acute retention.” As the diagnostic criteria by ICS proposes, painful or palpably distended bladder may not aid in differential diagnosis of AUR in females.<sup>[5,6]</sup> ICS comments that “the retention volume in AUR should be significantly greater than the expected normal bladder capacity.” Yet, it is unclear whether this refers to a functional, cystometric, or anatomic capacity.<sup>[7,8]</sup> Ramsey

and Palmer define AUR as an inability to void, with a retained urine volume of 200 ml or greater.<sup>[9]</sup> The data of drained urine volumes are usually not reported in similar studies. Our results show that women may seek urgent medical attention for sudden and complete inability to void with retained urine volumes lower than expected bladder capacities as well. Especially, if the underlying pathology is an outlet obstruction, a clinical diagnosis of AUR is justified despite low volumes of retained urine. On the other hand, we did not observe any adverse impact of a high volume of catheterized urine on the clinical prognosis of patients.

Temporary postoperative urinary retention is a common event. Its incidence in hospitalized women is lower as compared to men (2.9% vs. 4.7%).<sup>[10]</sup> Estimates of urinary retention rates after incontinence and prolapse surgery range from 2.5 to 24%.<sup>[11]</sup> Postpartum retention occurs in a range of 0.1–14.1% after vaginal delivery and up to 24.1% after cesarean delivery.<sup>[12–14]</sup> We observed that postoperative and postpartum patients may still be prone to AUR following discharge. The therapeutic approach to such emergencies is straightforward and usually does not necessitate further diagnostic evaluations.

Our results confirm the previous findings that cardiovascular disorders and diabetes mellitus are the most common medical conditions associated to urinary retention.<sup>[15,16]</sup> Urine analysis appeared as the most useful laboratory test. Although infection of the urinary tract has been reported among underlying factors for urinary retention, its role as a cause or a concurrence in AUR remains uncertain. Thorough abdominopelvic examination and ultrasonography of the pelvis remained as the most valuable tools for elucidating etiology in our analysis. Genital dermatological examination was decisive for detecting rare causes such as herpes simplex or zoster infection.

When evaluating AUR, invasive diagnostic tests may be deferred if evident and transient causes are present. Urodynamic studies and sphincter EMG are reserved for persistent, recurrent, or unexplained cases. Based on a previous evidence, the underlying disorder in female AUR is usually detrusor failure rather than outflow obstruction.<sup>[17–19]</sup> Painless, acute retention of high volumes of urine is likely to be associated with neurogenic bladder.<sup>[20,21]</sup> It is worth mentioning that physicians encountering acute neurologic conditions should be aware that urinary retention from neurologic causes occurs equally in men and women.<sup>[22]</sup>

The literature on female AUR involves inpatient data. A retrospective review reported the most common etiologies as urethral stenosis, urinary tract infection, nonurological postoperative retention, and clot retention, whereas no

etiology was found in a third.<sup>[23]</sup> Another report on inpatient database revealed the most common causes of AUR in women as malignancy (36%) and neuropathic bladder dysfunction (16%).<sup>[24]</sup> García-Fadrique *et al.* studied 202 women referred to their Neurourology and Urodynamics Unit after an AUR episode and stated the most frequent causes as neurological (26%) and unknown (23%).<sup>[25]</sup> Our cohort of outpatients comprises a distinct study group in comparison to other reports. The current findings, therefore, represent unique information on the prevalence and presentation of this urological condition in emergency medical practice.

Prognosis of female AUR is rarely disclosed in previous studies. In general, timely removal of the offending cause or addressing the underlying disorder restores normal bladder function. However, neurogenic causes and conditions affecting the primary detrusor function may pose difficulties in management. In our study group, 92.6% of the patients ultimately achieved spontaneous micturition after a diagnosis of AUR.

The main limitations of this study are the small number of patients and retrospective method of investigation. Nevertheless, the uncommonness of female AUR makes it difficult to design a prospective study in an outpatient population. While the present study focuses uniquely on outpatient data, it would still be injudicious to estimate a prevalence from our data because there might have been cases of AUR that had not been referred to the urology clinic. Furthermore, the relatively small number of patients with diverse etiologies precluded a detailed statistical analysis of our data. Another shortcoming of the present study is the inadequacy of cystometric findings for some of the patients who refused urodynamic investigations. Nevertheless, our results and relevant literature confirm that invasive tests are not compulsory in the workup of all female AUR cases.

## CONCLUSIONS

Among a population of outpatients presenting with acute emergency of urinary retention symptoms, the proportion of women with confirmed diagnosis of complete AUR was 23%. The causes of female AUR are diverse and may be multifactorial. Regardless of the etiology, prompt urethral catheterization with varied intervals resolved the acute emergency. The prognosis of outpatient female AUR cases in our study was generally favorable, with majority of women achieving spontaneous voiding following bladder decompression and correction of the underlying cause.

## Acknowledgment

The authors thank Prof. Dr. Tufan Tarcan, Marmara University School of Medicine, for critically reviewing the manuscript.



## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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