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DESCRIPTIVE STUDY OF ACUTE URINARY RETENTION IN A TERTIARY CARE CENTRE OF CENTRAL SRI LANKA

Anurudda Udaya Bandara Pethiyagoda[1]*, Inaam Niyas[1], Dulanjalee Lakmini Keeragala[1], Narasin Vidana Gamage Himali Erandika[1], Osura Rojith Amarajeewa[1], Lashan Chathuranga Silva[1] and Sithara Nilmini Warnasooriya[1]

Department of Surgery, Faculty of Medicine, University of Peradeniya, Sri Lanka.

***Corresponding Author: Anurudda Udaya Bandara Pethiyagoda**
Department of Surgery, Faculty of Medicine, University of Peradeniya, Sri Lanka.

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ABSTRACT

Introduction: Acute Urinary Retention (AUR) is a common, painful condition mainly affecting men above 60 years of age. **Objectives:** Detailed description of AUR in terms of demographics, risk factors, presentation, clinical examination, and management. **Method:** A retrospective analysis of 101 patients with AUR over 4 years. **Results:** Mean age was 64.79 years, most in the 61–70-year age (35.6%). Most were males (91.1%) enrolled in elementary occupations (56.06%). However, association of AUR with occupation cannot be commented upon due to disproportionate utilization of public health services by lower socio-economic classes. Smoking and alcohol consumption were significantly higher among males. Most (56.4%) had a long history of Lower Urinary Tract Symptoms (LUTS) prior to AUR (Median = 180 days), however only 42.1% of them received prior treatment. Men, and those who have not received treatment for LUTS tend to present earlier with AUR. Most had precipitated AUR (62.4%) due to a single precipitating factor (77.8%). Constipation (42.9%) and delay in micturition (41.3%) were the most common precipitants. Most AUR was successfully treated with simple urethral catheterization with a minority (5.9%) requiring suprapubic catheterization. The median residual volume was 850ml. In most patients, prostate was moderately enlarged (55.43%) and of firm consistency (82.2%), bladder could be palpated / percussed (87.1%), hernial orifices were intact (92.1%), external genitalia normal (92.1%), and no neurological abnormality (91%). **Conclusion:** AUR is a disease of elderly males, commonly precipitated by constipation or delay in micturition. Treatment of LUTS may delay / prevent onset of AUR.

KEYWORDS: Acute Retention, Benign Prostatic Hyperplasia, AUR, LUTS, Residual volume, Urinary Catheterization.

INTRODUCTION

Acute Urinary Retention (AUR) is a sudden inability to urinate with increasing lower abdominal pain with a pain threshold which is comparable with a renal colic.[1] Painless AUR is rare and is usually associated with CNS pathology.[2]

AUR can be classified as "Precipitated AUR" which occurs after an event such as non-prostate-related surgery, catheterization, anesthesia, medications with sympathomimetic or anticholinergic effects, antihistamines, or other events; and "Spontaneous AUR" consisting of all other AUR episodes.[3] The incidence of AUR ranges from 3.7-6.8% in community dwelling men, and 18-25% for the BPH population.[3]

Even though a proper understanding regarding how urinary retention occurs is lacking to date, three pathophysiological mechanisms are possible: bladder outlet obstruction, detrusor under-activity leading to bladder dilatation and neurogenic bladder. Urinary retention occurs via one or more of the above mechanisms.[4]

AUR can be considered as a disease of elderly as almost all patients belong to the age group of above 60 years of age with a trend of increasing incidence with age.[2,5] Most of them do have identifiable predisposing factors.[6] Amongst them, BPH remains a well-recognized risk factor that results in bladder outflow obstruction. A study done by Meigs et al revealed that men with moderate or severe Lower Urinary Tract Symptoms (LUTS) or BPH are 9 times more likely to experience an episode of AUR than those without symptoms of BPH[5], further confirming the above statement and the fact that the severity of previous LUTS also exhibit a direct relationship with the prevalence of AUR. This is also supported by the study done by Steven et al and Jacobson et al, which shows that patients with moderate to severe LUTS are at a 4-fold risk of getting AUR

compared to the patients with mild or no symptoms as assessed by the AUA symptom index.[7]

Another known risk factor is consumption of various medications.[2] Drugs with anticholinergic and adrenergic side effects result in relaxation of the bladder wall and constriction of bladder neck, especially in a patient with already compromised bladder function due to an enlarged prostate gland.[8] Although some studies have shown a significant rise in the incidence of AUR with consumption of anticholinergics, others show no such correlation even after 12weeks of treatment.[9] Diuretics also can result in AUR by producing more urine leading to bladder over distention while opiates contribute to AUR by impairing autonomic functions.[4]

Interestingly, smoking has been inversely associated with incidence of AUR according to the work done by A.V Sarma et al in 2009,[10] whereas alcohol ingestion can result in retention by both neurogenic suppression and increasing urine output leading to bladder over distention.[11]

All these patients are managed by inserting a urethral or suprapubic catheter as the first step and subjected to medical management and a subsequent trial without catheter, even though precise estimates regarding the success or failure of trial without catheter is lacking.[1,12] The fact that 24-42% of the patients with acute urinary retention end with a prostatectomy[2], illustrates the magnitude of this problem.

Descriptive studies on AUR in Sri Lanka are severely lacking, emphasizing the importance of a publication of this nature.

METHODOLOGY

A total of 101 patients with AUR who presented to the Surgical Unit of Teaching Hospital Peradeniya, were evaluated over a period of 4 years, from July 2017 to July 2021.

Patients were assessed using an interview-based questionnaire which included basic demographic details (age, gender, and occupation), clinical history (precipitating event, past history of AUR, alcohol and smoking history), and a detailed drug history. In-patient management records were referred to obtain details of first aid and management. Details of catheterization (catheter size, residual volume, character of urine) was also noted, along with any attempts at suprapubic aspiration / catherization. Finally, a clinical examination was carried out which included an abdominal examination, digital rectal examination, neurological examination, and examination of external genitalia.

Analysis was performed using the Statistical Package for the Social Sciences version 25. Chi-square, Independent T-test, and Mann-Whitney U tests were used to check for associations of statistical significance. A significance of 0.05 was accepted for all analyses.

RESULTS AND DISCUSSION

Study population

A total of 101 patients were enrolled in our study over a 4-year period.

Table 1: Number of patients enrolled in the study, by year.

Year	Number of patients	Percent (%)
2017	30	29.7
2018	16	15.8
2019	33	32.7
2020	17	16.8
2021	5	5.0
Total	**101**	**100.0**

Age

Age distribution of the study population closely followed a normal distribution (p=0.000) with a skewness of -1.174. The mean age was 64.79 years with a modal age was 62 years. The youngest patient was 16, and the oldest was 86 years old.

Patients were grouped into 10-year age categories which showed the highest incidence in the 61-70 year age group (35.6%, n=36) followed by the 71-80 year age group (28.7%, n=29).

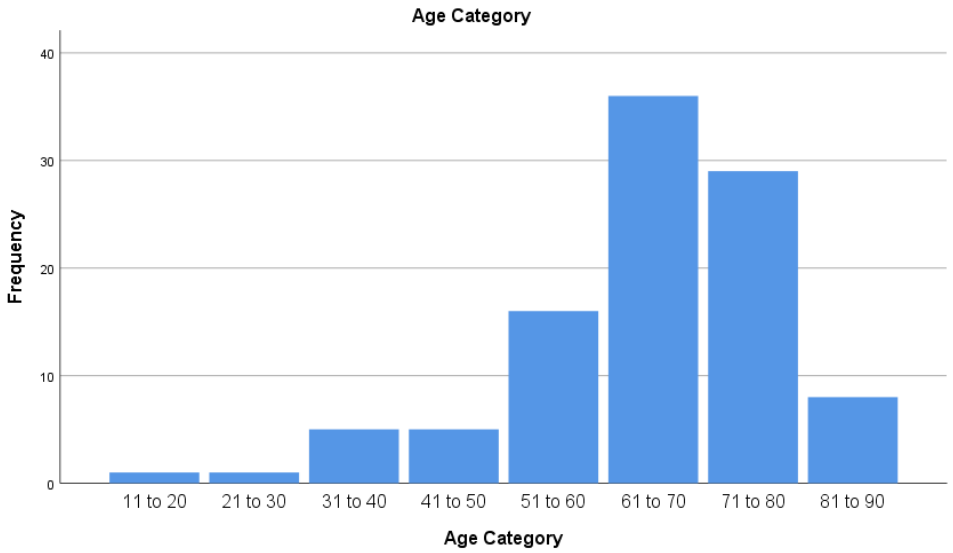

Figure 1: Age distribution of the study population by 10-year age categories showing the largest number of patients in the 61-70 and 71-80 year age categories.

Sex

The bulk of the patients with AUR was male (n=92, 91.1%), with relatively less females (n=9, 8.9%), in keeping with the inherent predisposition of males for AUR.

Occupation

Occupations were classified using the "International Standard Classification of Occupations".[13]

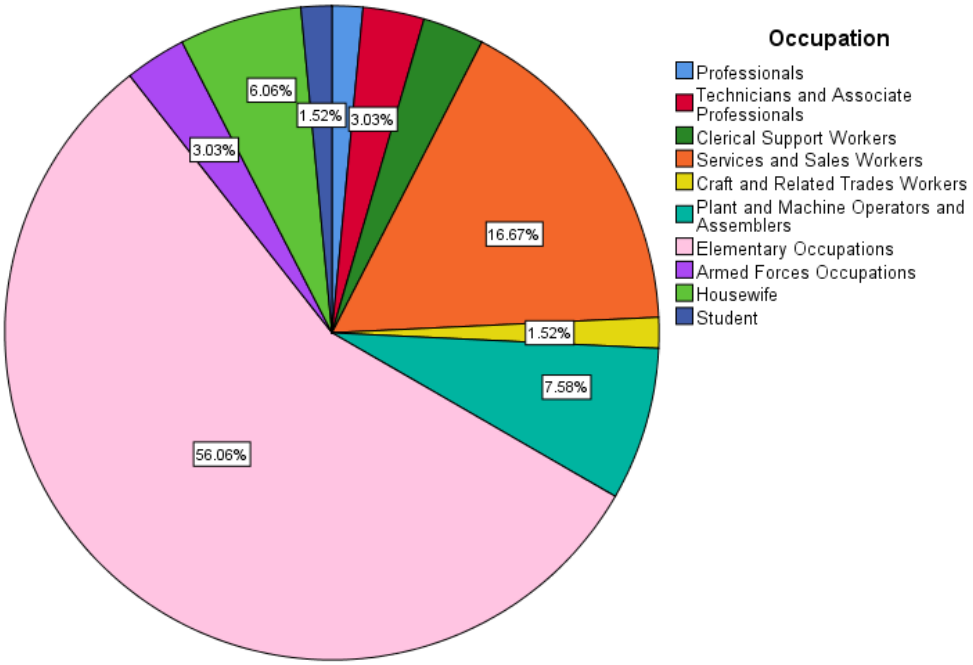

Figure 2: Distribution of occupations in the study population according to the "International Standard Classification of Occupations" showing a large proportion of "Elementary Occupations"

The distribution of occupations among the study population showed a large proportion of "Elementary Occupations" such as laborers and agricultural workers. This reflects the disproportionate usage of public health care services by patients of lower socio-economic classes, due to the preference by richer and high-educated patients for private healthcare.[14] This is in-spite of the equivalent level of care provided by the two sectors despite the 3-5-fold difference in spending per patient in the private sector.[15]

Alcohol and Cigarette consumption

The pattern of alcohol and cigarette consumption in patients with AUR is as shown below.

Table 2: Distribution of Alcohol and Cigarette consumption among the study population.

	Non-consumer	Current consumer	Ex-consumer
Alcohol	63.4%	27.7%	8.9%
Smoking	69.3%	26.7%	4.0%

The alcohol and smoking patterns showed an expected large male dominance, with all female patients in our study population being non-consumers of alcohol and cigarettes (100%, n-9). This difference between the sexes was statistically significant for both alcohol (p=0.003) and smoking (p=0.008).

The pattern of alcohol and cigarette smoking among male patients was as shown below.

Table 3: Distribution of Alcohol and Cigarette consumption among males in the study population.

	Non-consumer	Current consumer	Ex-consumer
Alcohol	59.8%	30.4%	9.8%
Smoking	66.3%	29.3%	4.3%

Medication use

42% of patients with AUR were users of one or more medications at the time of presentation. The pattern of medication usage among patients with AUR is as shown below.

Table 4: Distribution of medication usage among the study population.

	Users	Non-users
Any Medication	41.6%	58.4%
Aspirin	6.9%	93.1%
Anti-Hypertensives	13.9%	86.1%
Anti-Diabetic	13.9%	86.1%
Alpha blockers	8.9%	91.1%
5-alpha reductase inhibitors	4.0%	96.0%
Anticholinergics	1.0%	99.0%
Antiepileptics	2.0%	98.0%
Antipsychotics	0.0%	100.0%
Antidepressants	2.0%	98.0%
Diuretics	1.0%	99.0%
Statins	3.0%	97.0%
Other Medications	15.8%	84.2%

Past history of Lower Urinary Tract Symptoms (LUTS)

Most patients with AUR (56.4%, n=57) gave a history of previous Lower Urinary Tract Symptoms (LUTS). However, of the patients with LUTS, only 42.1% (n=24) had received treatment for their symptoms while the remaining 57.9% (n=33) had received no treatment.

Of the patients who received treatment for LUTS, the majority (70.8%, n=17) had received medical treatment with alpha blockers and/or 5-alpha reductase inhibitors. 3 patients (12.5%) had received treatment with urinary catheterization with/without a "Trial Without Catheter" (TWOC) and a further 3 patients (12.5%) had received surgical treatment. 1 patient (4.2%) had received Ayurvedic treatment for LUTS prior to presenting with AUR.

The median duration of LUTS prior to first presentation with AUR was 180 days. The shortest period of LUTS prior to presentation with AUR was 1 day and the longest period was 10 years. Among those with previous LUTS, men tended to present earlier with AUR (median = 180 days) than women (Median = 730 days). This difference did not however reach statistical significance (p=0.177).

Patients with LUTS who had received treatment, tended to present later with AUR (median = 365 days) than those who were untreated (median = 180 days). This difference did not however reach statistically significance (p = 0.510). The delay in presentation with AUR in patients who receive treatment for LUTS is in keeping with the findings of the MTOPS trial which showed a reduced risk of AUR in men with Benign Prostatic Hyperplasia (BPH) who received medical therapy.[16] A longer period of study with greater number of participants would likely push this finding into the territory of statistical significance.

There was no statistically significant difference in the duration of patients with LUTS to present with AUR depending on their smoking or alcohol consumption habits.

Precipitated vs Spontaneous AUR

Most patients experienced precipitated AUR (62.4%, n=63) as opposed to spontaneous AUR (37.6%, n=38). Of the patients with precipitated AUR, the majority (77.8%, n=49) had a single precipitant while 8 patients (12.7%) had 2 precipitants and 6 patients (9.5%) had 3 precipitants respectively.

The breakdown of different precipitating factors among those patients with precipitated AUR is as shown below. Constipation and delay in micturition were the most common by far.

Table 5: Distribution of precipitating factors for AUR in the study population.

	Yes		No	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Delay in Micturition	26	41.3%	37	58.7%
Constipation	27	42.9%	36	57.1%
Alcohol	8	12.7%	55	87.3%
Medications	3	4.8%	60	95.2%
Urinary Tract Infection	7	11.1%	56	88.9%
Surgery	8	12.7%	55	87.3%
Cystoscopy	1	1.6%	62	98.4%
Catheter Block	1	1.6%	62	98.4%
Other	2	3.2%	61	96.8%

Treatment

From the treatment point of view, all patients received catheterization to relieve their AUR. Most patients (94.1%, n=95) were managed with simple urethral catherization (UC) alone, however a minority (5.9%, n=6) required suprapubic catheterization (SPC).

There was no statistically significant difference between the prostate size (estimated clinically) and the need for SPC.

The median residual volume following catheterization was 850ml. There was no significant difference in the type of catheter required (UC / SPC) according to the residual volume (p=0.707). Likewise, there was no significant difference in residual volume according to clinically measured prostate size (p=0.916) or prostate consistency (p=0.698).

Digital Rectal Examination (DRE)

All male patients (n=92) underwent Digital Rectal Examination (DRE) to assess the prostate gland and condition of the rectum. Most prostate glands (82.2%, n=83) were firm in consistency, while few were hard (5%, n=5) or soft (4%, n=4).

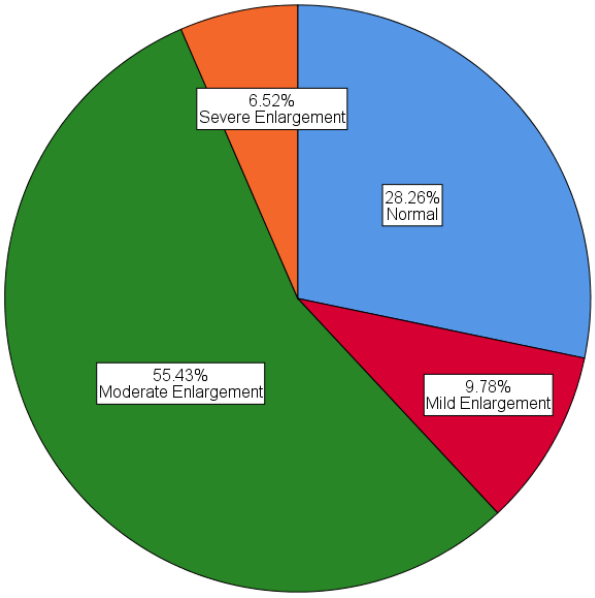

Figure 3: Distribution of size of the prostate gland among males of the study population.

When considering the size of the prostate, most patients had moderate enlargement. There was no statistically significant difference in duration of LUTS prior to presenting with AUR between patients with normal prostates and those with prostatic enlargement (mild, moderate, or severe) on clinical examination (p=0.65).

With regard to condition of the rectum on DRE, most patients had normal stools (45.5%, n=46), but a similar number had an empty rectum (42.6%, n=43). Very few patients (11.9%, n=12) had hard stools in the rectum.

Abdominal Examination

Abdominal examination was performed to assess the urinary bladder, hernial orifices, and abdominopelvic masses.

On assessment of the bladder, bladder was non-palpable and non-percussable in 13 patients (12.9%), palpable but not percussable in 42 patients (41.6%), percussable but not palpable in 2 patients (2%), and both palpable and percussable in 44 patients (43.6%).

Hernial orifices were intact in most patients (92.1%, n=93), with few patients having clinically appreciable hernias (7.9%, n=8). Only 1 patient (1%) had an abdominopelvic mass identified on abdominal examination.

External Genitalia

External genitalia were examined in all patients. Most (92.1% n=93) had clinically normal genitalia. Pathological lesions seen in the external genitalia were – Meatal Stenosis (4%, n=4), Balanitis Xerotica Obliterans (1%, n=1), Uterovaginal Prolapse (1%, n=1), Blood at meatus (1%, n=1), and Hypospadiasis (1%, n=1).

Neurological examination

All patients were subjected to a complete neurological examination. Most patients (90.1%, n=91) had a completely normal neurological examination. Significant neurological findings known to cause acute retention (eg: paraplegia) were seen in 6 patients (5.9%), and neurological findings which do not normally manifest as AUR (eg: Bell's palsy, isolated sensory disturbance) were seen in 4 patients (4%).

CONCLUSION

AUR is a common disease of elderly, affecting mainly the 61–70-year age group, with a large male preponderance. High rates of alcohol consumption and medication use for co-morbid conditions are possible precipitating factors involved. Alcohol and smoking patterns in Sri Lanka show a huge male dominance.

Most patients (56.4%) have a long history of LUTS prior to presentation with AUR (Median = 180 days), however only 42.1% of these patients have received prior treatment for this. Medical treatment is the most common treatment received by patients for LUTS (70.8%). Men tend to present earlier with AUR than women, while patients who received treatment for LUTS, tend to present later. Most patients have precipitated AUR (62.4%), of which most have a single precipitating factor (77.8%). Constipation and delay in micturition are by far the most common precipitants (42.9% and 41.3% respectively).

Most patients are successfully treated with simple urethral catheterization alone with a minority (5.9%) requiring suprapubic catheterization. The median residual volume following catheterization is 850ml. On DRE, most glands are moderately enlarged (55.43%) and of firm consistency (82.2%) while the rectum has normal stools, or is empty in most patients. Bladder can be either palpated or percussed in most patients (87.1%) and Hernial orifices were intact in the majority (92.1%). Likewise, most patients had normal external genitalia (92.1%) and neurological examination (91%).

Association of AUR with occupation cannot be commented upon due to a disproportionate utilization of public health services in Sri Lanka by patients of lower socio-economic classes.

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