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Managing older patients with urinary retention in the Continence Clinic

理遺專科診所對老年尿滯留患者的治療

Objective. To evaluate the effectiveness of the Continence Clinic for managing retention of urine in older patients.
Design. Retrospective study.
Setting. Continence Clinic, Fung Yiu King Hospital, Hong Kong.
Subjects and methods. Case notes of 58 patients seen at the Fung Yiu King Hospital Continence Clinic from October 1997 to September 2001 were reviewed. The patients had retention of urine with post-void residual volume of more than 200 mL, retention of urine requiring catheterization, or had catheters for unknown reasons.
Results. Urodynamic study performed for 22 (38%) patients showed that 12 had detrusor underactivity, six had detrusor hyperactivity with impaired contraction, and four had bladder outlet obstruction. Among the patients who were initially catheterized, the success rate for gradually stopping reliance on urinary catheterization was 84%. The success rate was higher among those who did not undergo urodynamic study than among those who had the study done (95% versus 67%; P=0.03). Reduction in post-void residual volume was observed at the last clinic visits (P<0.0001). Moreover, significant decreases in post-void residual volume were found both for patients who did and did not have urodynamic study.
Conclusion. Most of the older patients with urinary retention with or without indwelling catheters were treated successfully in the Continence Clinic by appropriate medical therapy. Urodynamic study can be performed for selected patients when managing urinary retention.

目的：評估理遺專科診所對治療老年尿滯留患者的效果。
設計：回顧性研究。
安排：香港東華三院馮堯敬醫院理遺專科診所。
患者與方法：回顧 1997 年 10 月至 2001 年 9 月，馮堯敬醫院理遺專科診所 58 名患者的紀錄。患者都是尿滯留量超過200毫升，或因尿滯留而需插入尿導管，或因不明原因曾使用尿導管。
結果：22 名(38%)患者曾接受尿動力學研究，結果顯示 12 名患者的逼尿肌不夠活躍， 6 名患者的逼尿肌因過度活躍而削弱了收縮能力， 4 名患者出現膀胱出口阻塞。在最初接受尿導管插入的患者中，有 84% 可以成功逐漸停止依賴尿導管。此外，沒有接受尿動力學研究的患者的成功率高於曾接受尿動力學研究的患者(95% 比 67%；P=0.03)。最近期的診症觀察到患者的尿滯留量亦已減少(P<0.0001)。而且，無論有沒有接受尿動力學研究的患者，尿滯留量均有減少。
結論：在理遺專科診所，大部分的老年尿滯留患者，無論他們有沒有曾經使用尿導管，都可以得到成功的治療。在治療尿滯留時，可以因應病情及治療需要而選擇是否要進行尿動力學研究。

Key words:
Aged;
Urinary retention

關鍵詞：
老年；
尿滯留

Hong Kong Med J 2003;9:15-9

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Introduction

Urinary incontinence is a common problem among the older population.[1,2] In Hong Kong, the prevalence of incontinence in elderly patients older than 60 years living in the community is 3.2%.[3] A local study shows that the prevalence of incontinence in acute care hospitals, convalescence hospitals, and care and attention homes is 10.9%, 37.6%, and 23.3%, respectively, with an overall prevalence of 24.5%.[4]

Urinary incontinence can be classified according to the clinical presentations of urge, stress, overflow, and functional incontinence.[1] One of the conditions closely related to urinary incontinence is retention of urine (ROU). Normally, the post-void residual (PVR) urine volume increases with age but usually to no more than 100 mL.[5] A PVR volume of less than 100 mL in the absence of straining to void generally reflects adequate bladder emptying for geriatric patients. Although there is no precise cut-off for abnormally high PVR volumes in the older population, most experts agree that a PVR volume of more than 200 mL is abnormal and needs further investigation.[6] Retention of urine in elderly people can be caused by bladder outlet obstruction associated with benign and malignant prostatic enlargement, urethral stricture, or cystocele. Retention of urine can also be the result of detrusor underactivity, detrusor hyperactivity with impaired contraction, or detrusor sphincter dyssynergia.[7]

Retention of urine is associated with urinary incontinence in many ways. A man with bladder outlet obstruction due to benign prostatic hypertrophy can have a high PVR volume but present with urge incontinence due to an unstable bladder.[1] In detrusor hyperactivity with impaired contraction, the bladder is overactive but empties ineffectively.[8] The patient may have an unstable bladder with diminished bladder contractile function, resulting in both urge incontinence as well as high PVR volume in the bladder. Detrusor sphincter dyssynergia is another condition that is commonly associated with ROU, in which overflow incontinence may occur when the bladder is over-distended.[9] Moreover, treatment of ROU with cholinergic agents can result in urge incontinence, while management of urge incontinence with anticholinergic agents may precipitate ROU.[10] As a corollary to the close relationship of ROU and urinary incontinence, recognition and management of ROU in elderly patients is clinically important.

The occurrence of ROU can have serious consequences for elderly people. These include overflow incontinence, urinary tract infection, hydronephrosis, hydroureter, and renal failure, as well as psychological disturbances.[7,11] The care of patients with incontinence and ROU has a large financial impact on society.[12] Not uncommonly, patients with ROU are treated by long-term catheterization.

In general, the first step in the management of ROU is the identification and treatment of transient factors that contribute to ROU.[1,6] For instance, constipation and urinary tract infection should be treated. If possible, medications that affect bladder function should be stopped. Bladder training, behavioural modifications, and teaching patients special voiding skills such as augmented voiding techniques and the double voiding method should be tried for appropriate patients. Specific drug treatments for bladder dysfunction or outflow tract obstruction may be initiated depending on the likely clinical diagnosis with or without the help of urodynamic study. Surgical treatment is indicated for selected patients such as those with severe benign prostatic hypertrophy. For patients with indwelling catheters, the ultimate goal is to gradually stop the reliance on catheters. Usually, patients from the Continence Clinic are admitted to Fung Yiu King Hospital (FYKH) to stop the reliance on urinary catheters because PVR can be more closely monitored in a ward. Occasionally, long-term catheterization or intermittent catheterization may be needed for patients who are resistant to other treatment.

The aim of this study was to examine the management of ROU in the Continence Clinic. Outcomes such as reduction in PVR volumes and the success rate for stopping use of indwelling urinary catheters were evaluated.

Methods

This study is a retrospective study in which the records of the patients seen at the FYKH Continence Clinic from October 1997 to September 2001 were reviewed. The Continence Clinic was established in 1997. All patients attending the clinic were seen by a continence team, consisting of experienced continence nurses and geriatricians. To be included in the review, the patients had to present to the Continence Clinic with ROU with PVR volume ≥200 mL, ROU requiring an indwelling urinary catheter, or had an indwelling urinary catheter for unknown reasons.

During the review, information about the patients' demographic and socio-economic background was collected. The presenting problems, referral source, duration of follow-up in the clinic, and number and types of co-morbid medical conditions as well as medications were noted. Assessment of cognitive function, mobility, and functional status was performed. Patients with a history of dementia or dementia symptoms were noted to be cognitively impaired. Patients were classified according to their mobility as an independent walker, independent walker with walking aids, assisted walker (needed supervision or assistance by carers during walking), or chair-bound. The functional status was classified as independent, partially independent (needed assistance with some basic activities of daily living [ADL]), or totally dependent for basic ADL. The urodynamic diagnoses among those who had urodynamic study and the management offered were recorded.

The primary outcome was change in PVR volumes measured by portable ultrasound machine (BVI 2500; Diagnostic Ultrasound Corp., Redmond, US) between the first and last visits.[7,13] The determination of PVR volumes is important for the assessment of patients with urinary incontinence to exclude significant ROU.[7,13] The usual gold standard for measuring PVR volumes is the use of catheter urine volumes.[14] Recent studies have demonstrated that high sensitivity and specificity for various urine volumes can be obtained using the portable ultrasound machine. This machine also provides a non-invasive means of determining residual bladder urine volumes with high accuracy.[7,13]

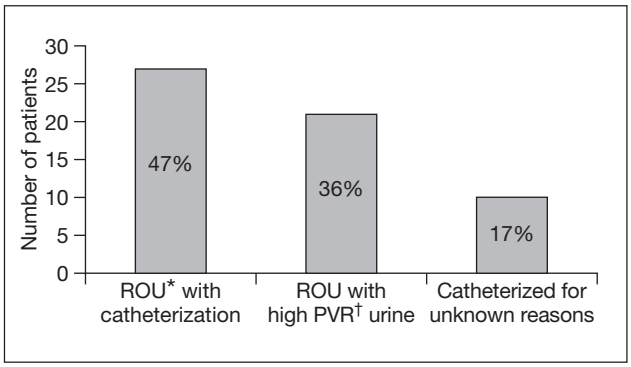
All PVR volumes were determined by the continence nurses within 5 minutes of a spontaneous continent or incontinent void with the portable ultrasound machine. The second outcome was the success rates for stopping reliance on a urinary catheter.

Statistics

Descriptive statistics were performed for demographic characteristics, number of diagnoses and medications, source of referral, and type of accommodation. Continuous variables were expressed as mean ± standard error of the mean. Paired *t* test was used to compare the differences between the initial PVR volume and that at the last visit. Fisher's exact test was employed to compare the success rates for stopping reliance on a urinary catheter between those who did and did not have urodynamic study. Statistical significance was accepted as $P<0.05$. The statistical analysis was done by the Statistical Package for Social Science (Windows version 7.5; SPSS Inc, Chicago, US).

Results

Seventy-five case records were reviewed. Seventeen were excluded from the final analysis due to incomplete data—four patients defaulted follow-up in the Continence Clinic while 13 had incomplete outcome documentation. The remaining 58 patients consisted of 13 men and 45 women with an average age of 82.80 ± 0.94 years (Table). This group of patients were 'frail' as evidenced by the fact that a high proportion needed assistance in ADL and had impaired cognitive function and mobility (Table). These patients also had many co-morbid medical conditions and were receiving multiple medications (Table). Many of the patients (59%) lived in old age homes.



* ROU retention of urine
† PVR post-void residual

Fig 1. Diagnoses of study patients (n=58)

The most common presenting problem was ROU requiring an indwelling urinary catheter (n=27, 47%), followed by ROU with PVR volume ≥200 mL (n=21, 36%), and catheterization for unknown reasons (n=10, 17%) [Fig 1]. Thirty-seven (64%) patients had indwelling catheters when they

Table. Demographic and background information of the subjects

	Patient No. (%)	Mean ± standard error of the mean
No. of patients	58	-
Male	13 (22)	-
Female	45 (78)	-
Age (years)	58	82.8 ± 0.94
Cognitive function*	55	-
Normal	33 (60)	-
Impaired	22 (40)	-
Mobility*	56	-
Independent walker	6 (11)	-
Independent with walking aids	22 (39)	-
Assisted walker	20 (36)	-
Chair-bound	8 (14)	-
Functional state*	57	-
Independent in ADL†	11 (19)	-
Partially dependent in ADL	34 (60)	-
Totally dependent in ADL	12 (21)	-
Number of diagnoses per patient	58	4.27 ± 0.26 (range, 1 to 11)
Number of regular drugs per patient	58	3.9 ± 0.28 (range, 0 to 11)
Accommodation	58	-
Private old age home	23 (39)	-
Care and attention home	12 (20)	-
Own home	23 (39)	-
Source of referral	58	-
FYKH‡ in-patient geriatric team	40 (69)	-
CGAT§	10 (17)	-
GDH‖	2 (3.4)	-
QMH¶ in-patient geriatric team	1 (1.8)	-
QMH geriatric clinic	1 (1.8)	-
Others	4 (7)	-

* Cognitive, mobility, and functional assessments were documented in 55, 56, and 57 subjects, respectively
† ADL Activities of daily living
‡ FYKH Fung Yiu King Hospital
§ CGAT Community Geriatric Assessment Team
‖ GDH Geriatric Day Hospital
¶ QMH Queen Mary Hospital

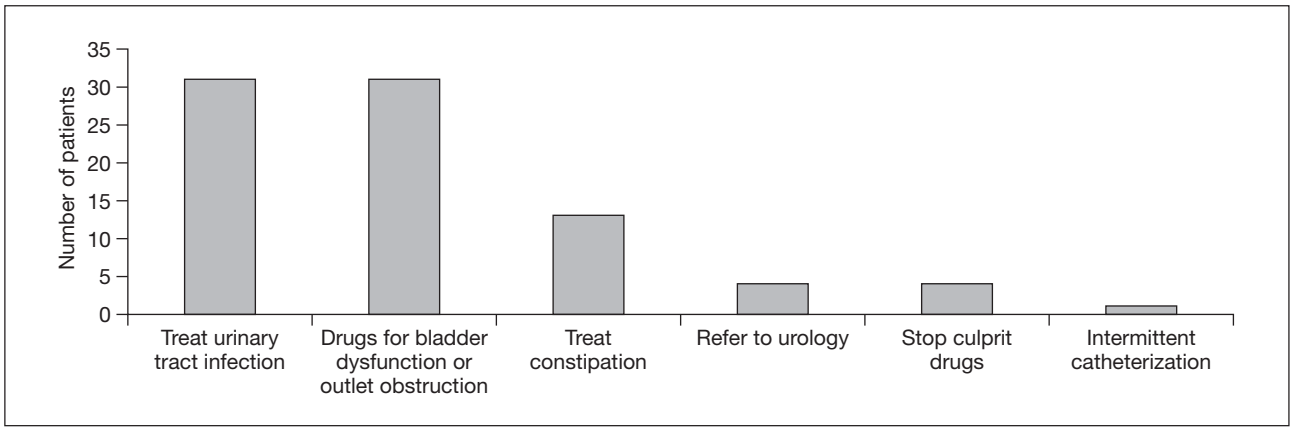


Fig 2. Types of treatment

first attended the Continence Clinic. Most patients (69%) were referred to the Continence Clinic by the medical teams at the hospital when they were receiving treatment in the hospital for other conditions. A further 17% were referred by the Community Geriatric Assessment Team (CGAT) during assessment in old age homes (Table). The remaining 14% were from other sources such as the Geriatric Clinic at Queen Mary Hospital and FYKH Geriatric Day Hospital. The mean duration of follow-up in the Continence Clinic was 172.0 ± 20.5 days.

Urodynamic study performed in 22 (38%) patients showed that 12 had detrusor underactivity, 6 had detrusor hyperactivity with impaired contraction, and 4 had outflow tract obstruction. Thirty-one (53%) and 13 (22%) patients received treatment for urinary tract infection and constipation, respectively, while 4 (7%) patients needed to stop medications that were affecting bladder function (Fig 2). Specific drug treatment for bladder dysfunction or outflow tract obstruction was initiated in 31 (53%) patients (Fig 2). Most patients (n=27, 47%) were treated with cholinergic agents, while five (8.6%) patients were prescribed α-antagonists and two (3.4%) were given the anti-cholinergic agent oxybutynin. Two (3.4%) patients were treated with two specific medications for bladder dysfunction and outflow tract obstruction at the same time. Four patients were referred to the urologist for further management. Among the 37 patients who initially had a catheter, 31 had the catheters removed (84% success rate). The success rate for stopping reliance on a catheter was higher among patients who did not have urodynamic study (n=22) than for those who had the study done (n=15) [success rate, 95% versus 67%; P=0.03]. A significant reduction in PVR volume was observed at the last visits of the 21 patients initially presenting to the Continence Clinic with ROU and PVR volume ≥200 mL (465 ± 64 mL versus 68 ± 11 mL at first and last visits, respectively; P<0.0001). Significant reductions in PVR volume at the last visits were found for those patients who had urodynamic study performed as well as for those who did not (Fig 3).

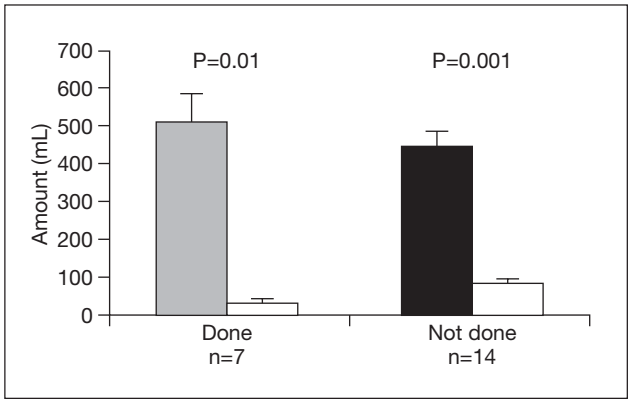


Fig 3. Change of post-void residual volumes for patients who did and did not undergo urodynamic study

Discussion

This study showed a significant improvement in PVR volumes for patients treated at the FYKH Continence Clinic. The study also demonstrated a success rate of 84% for stopping reliance on indwelling urinary catheters by elderly patients with ROU. These patients attending the Continence Clinic represented a group of frail elderly people with multiple pathologies, polypharmacy, and impaired cognition, mobility, and functional state. This finding suggests that the Continence Clinic is a suitable place for managing ROU in elderly patients. More importantly, a satisfactory outcome can be expected for frail elderly patients.

Although patients who did and did not undergo urodynamic study had significant reductions in PVR volume, those who had urodynamic study had a significantly lower success rate for removing reliance on urinary catheterization than those who did not have urodynamic study. At the Continence Clinic, urodynamic studies were selectively performed for cooperative patients who had persistent ROU, those who retained reliance on urinary catheters despite empirical treatment, or those with an uncertain diagnosis. This selection bias served to explain why a poorer success rate was observed for patients undergoing urodynamic study.

The success at reducing PVR volume and stopping reliance on urinary catheterization for patients who did not undergo urodynamic study suggests that many patients

with ROU, with and without indwelling catheters, could be managed according to clinical judgement. Eradication of transient factors such as urinary tract infection and constipation, and stopping culprit medications with empirical drug therapy for bladder dysfunction or bladder outlet obstruction could initially be tried. For patients resistant to this approach or with an uncertain diagnosis, urodynamic study would be helpful to delineate the bladder pathology and to guide the treatment strategy.[15]

In this study, detrusor underactivity was the most common finding of the urodynamic examination, while obstructive uropathy was uncommon. The literature shows that bladder outlet obstruction secondary to prostatic pathology with overflow incontinence was the second most common cause of incontinence for older men.[1] The relatively low incidence of obstructive uropathy diagnosed by urodynamic study in this report could be explained by the smaller number of men in the study group and the tendency of referring patients with bladder outlet obstruction to the urologists for management rather than to the Continence Clinic.

The major limitation of this study was the use of retrospective methodology. Similar to other retrospective investigations, the accuracy of the data relied on the quality of the documentation in the case notes. The other limitation was that the types of intervention that lead to successful removal of reliance on catheters were not identified in this study. The small number of patients meant that the sample was potentially biased and the results in this study might not be translated to the general elderly population. In addition, prospective randomised controlled trials are necessary to demonstrate the exact benefits and cost-effectiveness of the Continence Clinic for managing ROU in elderly patients. Similarly, the influence of urodynamic study in the management of patients with ROU should be further explored by randomised controlled studies.

Conclusion

This study illustrated that the condition of frail elderly patients with ROU with and without catheters could improve after appropriate treatment. The Continence Clinic appears to be a suitable place for the management of ROU in elderly patients. Eradication of transient factors and empirical drug therapy for bladder dysfunction for selected patients was an appropriate first-line strategy. For patients in whom this strategy is not successful or for those with uncertain diagnosis, urodynamic study would be helpful to guide treatment.

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