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Intermittent catheterisation in older people: a valuable alternative to an indwelling catheter?

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Abstract

Objectives: to investigate whether intermittent catheterisation is a valuable alternative to an indwelling catheter in patients older than 70 years with post-void residuals more than 50% of the bladder capacity.
Patients and methods: we retrospectively reviewed the medical records of 21 patients (14 women, 7 men) older than 70 years in whom intermittent catheterisation was initiated because of voiding dysfunction with post-void residuals more than 50% of the bladder capacity resistant to other treatment. Twelve patients mastered the technique of intermittent self-catheterisation, seven were catheterised by their partners and two by nurses.
Results: the mean age of patients was 76.5 years (range 71–83 years) and the mean observation period with regard to intermittent catheterisation was 27.9 months (range 5–129 months). For those relying on intermittent catheterisation, the urinary tract infection rate was 0.84 per year and patient (range 0–3), and urinary continence was restored in all of the six previously incontinent patients. Eighteen of the 21 patients reported a significantly improved quality of life owing to the restoration of urinary continence, decreasing of daytime frequency, nocturia and urge, and the lowering of the urinary tract infection rate.
Conclusions: intermittent (self-) catheterisation is a safe and valuable technique in older people with significant post-void residuals owing to detrusor underactivity. Urinary continence is restored, urge, daytime frequency and nocturia are decreased, and the urinary tract infection rate is diminished, resulting in improved quality of life. Therefore, intermittent (self-) catheterisation is strongly recommended in older people.

Keywords: *intermittent catheterisation, indwelling catheterisation, older people, elderly*

Introduction

Voiding symptoms are common in older people and are caused by bladder outlet obstruction, underactive detrusor or a combination of both. For accurate diagnosis, pressure-flow studies are necessary [1]. Bladder outlet obstruction is usually treated successfully by medication or surgery even in frail older patients; however, the management of underactive detrusor remains a challenge. In geriatric patients, post-void residuals up to 50% of the bladder capacity can be accepted [2], but larger amounts need treatment to avoid major complications such as hydronephrosis and urosepsis. However, post-void residuals due to detrusor underactivity are often resistant to conservative management including double or triple voiding, implementation of the Credé manoeuvre, medical therapy with parasympathomimetics, prostaglandin E_2 and α-blockers and intravesical electrostimulation, so catheterisation has to be started.

Intermittent catheterisation has become the gold standard for managing the neurogenic bladder because of the lower urological complication rate compared with a chronic indwelling urethral or suprapubic catheter [3]. However, intermittent catheterisation is seldom used in older people. This is probably due to the widespread opinion that older people are unable to master this technique. Therefore, we retrospectively investigated whether intermittent catheterisation is a safe and valuable alternative to an indwelling catheter in patients older than 70 years with post-void residuals more than 50% of the bladder capacity.

Patients and methods

Patients

We retrospectively reviewed the medical records of 21 patients (14 women, 7 men) older than 70 years in whom intermittent catheterisation was initiated because of voiding dysfunction with post-void residuals more than 50% of the

bladder capacity resistant to other treatment. Originally 23 patients (15 women, 8 men) entered the study but 2 of them (1 man, 1 woman) were excluded from further analysis because intermittent catheterisation performed with the help of a spouse could not be continued as these patients were transferred to a nursing home where intermittent catheterisation was not possible. According to the nursing home records this was due to a shortage of staff.

The patients reported slow stream, straining, feeling of incomplete emptying, increased daytime frequency, nocturia and urgency. In addition, six complained about urge incontinence.

All patients underwent a complete urological evaluation, including medical history, physical examination, bladder diary, urinalysis, urine culture and urodynamic studies. Six patients had an acontractile and 14 an underactive detrusor. In the remaining patient, an underactive detrusor combined with neurogenic detrusor overactivity and detrusor sphincter dyssynergia was found. All methods, definitions and units conform to the standards recommended by the International Continence Society [4].

The aetiology of detrusor underactivity was neurogenic in 19 patients and myogenic in 2 patients. It was due to: bladder denervation following pelvic surgery (hysterectomy or rectal amputation) in 7 patients; diabetic cystopathy in 2 patients; myogenic detrusor impairment secondary to overdistention because of bladder outlet obstruction by prostatic enlargement in 2 cases; and multiple sclerosis, Parkinson's disease, spinal cord injury and conus cauda syndrome following laminectomy for disc protrusion in 10 patients.

Catheterisation technique

Intermittent catheterisation was performed using an aseptic technique (catheterisation out of the sleeve) as described by Stöhrer and Sauerwein [5]. Twelve patients mastered the technique of intermittent self-catheterisation, seven were catheterised by their partners and two by nurses. Fourteen patients used a conventional polyvinylchloride 12 French catheter with lubricant containing local anaesthetic and antiseptic, and seven used a coated hydrophilic 12 French catheter.

Catheterisation frequency varied from three to five times daily in patients unable to void spontaneously, and from one to three times daily in those with spontaneous voiding but post-void residuals over 50% of the bladder capacity, respectively. A catheterisation volume not exceeding 400 ml was sought. A regularly distributed fluid intake of about 1.5 l per 24 hours was recommended.

All patients were on low-dose antibiotic prophylaxis. Alternating over 2 weeks, seven patients used 100 mg nitrofurantoin, 250 mg cephalexin or 100 mg trimethoprim once a day in the evening, and four patients used 100 mg trimethoprim or 100 mg nitrofurantoin. Ten patients were on mono-prophylaxis with 100 mg nitrofurantoin.

Results

The mean age of the 21 patients was 76.5 years (range 71–83 years) and the mean observation period with regard to intermittent catheterisation was 27.9 months (range 5–129 months).

Before starting intermittent catheterisation, all patients suffered from symptomatic recurrent urinary tract infections. Antibiotics were prescribed by their general practitioners with or without urine culture, mostly for a short period of time until the urine became clear once more. However, none of these patients received real long-term infection prophylaxis. Relying on intermittent catheterisation, the urinary tract infection rate was 0.84 per year and per patient (range 0–3). In addition, in 10 of the 21 patients (48%) no urinary tract infection occurred during the observation period. Urinary continence was restored by intermittent catheterisation in all of the six patients reporting incontinence before starting this treatment.

Before starting intermittent catheterisation, 6 of 21 patients (29%) were unable to void spontaneously. Five of those were on a Foley catheter (without long-term infection prophylaxis) and one suffered from chronic urinary retention with overflow incontinence. In these patients, intermittent catheterisation was initiated four times per day. During the study period, bladder function was partially restored in four of them, resulting in reduction of the catheterisation frequency from 4 to 1.7 times (range 0–4 times) per day.

The daily frequency of intermittent catheterisation changed from 2.5 times (range once every second day to 5 times per day) in the beginning of the study to 2.2 times (range 0–6 times per day) at the end of the observation period.

Eighteen of the 21 patients (86%) reported that their quality of life improved significantly owing to intermittent catheterisation. This was mainly due to the restoration of continence, decreasing of daytime frequency, nocturia and urge, and the lowering of the urinary tract infection rate.

Discussion

Lower urinary tract dysfunction is a common problem in older people and is aggravated by the increasing degree of deficits of cognition and mobility in this group of patients. Because of the ageing population, the burden of this illness is a real challenge for all health care systems [1]. In the present study, we addressed the clinical management of patients older than 70 years with post-void residuals more than 50% of the bladder capacity. Post-void residuals are caused by bladder outlet obstruction, underactive detrusor or a combination of both. For accurate diagnosis of the underlying pathology, urodynamic studies are necessary [1].

Neurogenic and/or myogenic factors are involved in the pathogenesis of detrusor underactivity. At the cellular level it is characterised by widespread degenerative changes of both muscle cells and axons without accompanying regenerative changes [6]. Partial denervation with decreased number of mechanoreceptors and reduced bladder sensation results in chronic overdistention with secondary myogenic detrusor damage. Chronic retention of urine can lead to incontinence, formerly defined as overflow incontinence, which is found in about 10% of patients in nursing homes [7]. Moreover, impaired contractile function can be combined with detrusor overactivity, an often unrecognised, seemingly paradoxical entity that is reported to be the

second most common cause (about 33%) of urinary incontinence in institutionalised older people [8].

There are various therapeutic modalities in the management of voiding dysfunction due to detrusor underactivity. The Credé manoeuvre [9], double or triple voiding and timed micturition with the intention of minimising bladder work by optimising bladder capacity [10] can decrease post-void residuals. Pelvic floor rehabilitation using biofeedback or electrical neuromodulation has also been used to re-educate the pelvic floor muscles and achieve a relaxed urethral sphincter [11, 12]. Recently, promising results were reported with botulinum A toxin injections into the external sphincter, improving voiding dysfunction due to detrusor underactivity by reducing urethral sphincter resistance [13]. Many studies have investigated the use of therapeutic agents such as parasympathomimetics and prostaglandin E_2 to improve detrusor function [14]. Although there is some evidence of a pharmacological effect, the clinical benefit of such agents remains of questionable value. In addition, combination therapy with a cholinergic drug and an α-blocker may be considered as facilitating voiding by detrusor tonisation and reducing bladder outlet resistance [15]. Other treatment options include transurethral sphincterotomy [16] (however with the consequence of urinary incontinence), skeletal muscle relaxants [17], intravesical electrostimulation [18, 19] and sacral neuromodulation [20]. However, despite various therapeutic modalities, sufficient bladder emptying is often not achievable so catheterisation has to be started. While indwelling urethral and suprapubic catheters have been used traditionally, intermittent catheterisation has changed the modern management of voiding dysfunction. Unfortunately, in older people, chronic indwelling catheters are widely used. Indwelling catheterisation, however, includes complications such as renal inflammation and chronic pyelonephritis [21], bladder and urethral erosions, bladder stones, and cancer, as well as urosepsis [22].

In accordance with previous investigations [23, 24], our study shows that intermittent catheterisation is a safe and feasible technique even in older people, with excellent results up to 127 months after starting this treatment. Fifty-seven per cent of the patients mastered the technique of intermittent self-catheterisation, 33% were catheterised by their partners and 10% by nurses. Eighty-six per cent reported significantly improved quality of life since using intermittent catheterisation, mainly owing to the restoration of continence, decreasing of daytime frequency, nocturia and urge, and lowering of the urinary tract infection rate.

Considering the results of the present study, intermittent catheterisation should be favoured even in older people, minimising the complications associated with chronic indwelling catheters. Older people with adequate cognitive function, mobility, motivation and manual dexterity easily learn the technique of intermittent self-catheterisation. Moreover, visual disability is not necessarily a hindrance to intermittent self-catheterisation; in our study even a blind patient mastered this technique. Not offering intermittent catheterisation because of older age is unjustified and withholds from older people the possibility of improving their quality of life.

Intermittent catheterisation was not performed using a clean technique, but rather an aseptic technique (catheterisation out of the sleeve) as described by Stöhrer and Sauerwein [5]. Although prospective randomised trials are lacking, based on retrospective studies [25–28] and personal experience we believe that intermittent catheterisation using an aseptic technique is preferable to clean intermittent catheterisation. In addition, we recommend low-dose antibiotic prophylaxis as it is well tolerated by older people, prevents recurrent symptomatic urinary tract infections leading to further impairment of the bladder function and is less distressing than repeated antibiotic treatment in therapeutic dosage. One may discuss the question of whether the reduction in urinary tract infection is due to the regime of long-term infection prophylaxis rather than to the catheterisation regime. Both may have contributed to these good results: intermittent catheterisation guarantees a regular wash-out of bacteria; however, long-term low-dose infection prophylaxis may reduce remaining bacteria and those being brought into the bladder by intermittent catheterisation within the hollow of the lower urinary tract.

The limitations of our study are its retrospective, non-randomised design and the relatively small number of patients investigated. In addition, no validated questionnaires were used for assessing quality of life. We nevertheless believe that our results support the necessity of a more frequent use of intermittent catheterisation in older people and highlight relevant related aspects.

Conclusions

Intermittent (self-) catheterisation is a safe and valuable technique in older people with significant post-void residuals due to detrusor underactivity. Urinary continence is restored, urge, daytime frequency and nocturia are decreased, and the urinary tract infection rate is diminished, resulting in improved quality of life. Therefore, intermittent (self-) catheterisation is strongly recommended in people over 70 years, as well as in younger people.

Key points

- Intermittent (self-) catheterisation is a safe and valuable technique in patients older than 70 years with significant post-void residuals owing to detrusor underactivity.
- Intermittent (self-) catheterisation restores urinary continence, decreases urge, daytime frequency and nocturia, and diminishes the urinary tract infection rate, resulting in improved quality of life.
- Intermittent (self-) catheterisation is strongly recommended in older people with significant post-void residuals resistant to other treatment.

Conflict of interest

No conflict of interest.

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