Abstract

At least 50% of nursing home residents in Britain and North America suffer from urinary incontinence. It is associated with resident and staff morbidity. The assessment and management of such residents will depend on the capacity of the care staff and the capability of the resident. The minimum data set and resident assessment protocol may have a role in the assessment of incontinent residents. Behavioural strategies are more likely to be beneficial than drug treatment.

Keywords: urinary incontinence, nursing homes

Introduction

Urinary incontinence (UI) in frail nursing home (NH) residents is, in many ways, a more complicated problem to evaluate and manage than in younger, more robust groups who are more likely to be able to participate in assessment, likely to be more thoroughly investigated and also to be offered more comprehensive treatment for more straightforward conditions.

In this review we consider the epidemiology, aetiology, assessment and management of UI in a NH setting.

Prevalence and associated factors

A MORI Poll showed a lifetime prevalence of UI in all ages of 6.6% in males and 14.5% in females [1]. In a community prevalence study there was a prevalence of 6% in the over 65s and 15% in the over 85s (both sexes) [2]. A census of UI in Leicestershire, UK, reported about 2/3 of people in private NHs were incontinent of urine, compared with 1/3 in residential homes [3]. There was a substantial overlap between UI and physical dependency. A prevalence study using a cross national data base found a prevalence of UI in NHs in five European countries, North America and Japan varying between 43 and 65% [4]. UI was generally associated with greater age. There was marked variation between men and women: in France and Italy females predominated whereas in Iceland and Japan the opposite was true. In all countries UI was more prevalent in dependent residents (× 2–4). Similarly impaired cognitive function was strongly related to UI in all seven countries.

In a cross sectional study on 839 institutionalised patients in Italy, the overall prevalence of UI was 54.5%. This was highest in females – 59.8% (39.2% in males) and with great age: 73.7% in 95+ year olds (as against 26.5% in <65 years). Good cognitive function was correlated with less UI (36.2% versus 76.7% in demented subjects).

Furthermore, immobility was more likely to be associated with UI, 82.1% in bedridden patients compared with 23.8% in self-sufficient patients. UI was also associated with constipation, faecal incontinence (FI) and urinary tract infections (UTIs) [5].

In the USA UI affects approximately 50% of NH residents [6]. It is more prevalent in functionally impaired individuals, it is more severe than in aged community dwellers and more often seen with FI [7]. Also, an American study revealed that immobility emerged as the best predictor for UI in NH residents followed by cognitive impairment [8].

The severity of UI has been variously defined. For example Ouslander et al. [9] defined it as any reported daytime UI. Similarly impaired cognitive function was strongly related to UI in all seven countries.

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Morbidity

Whilst cognitively intact older people living in the community are known to suffer adverse social and behavioural consequences due to UI [12, 13], little is written about such consequence in NH residents. Proving a relationship between incontinence and psychological distress has been difficult. Herzog observed a weak link in community dwellers with UI, but suggested it may be related to generally poorer health [14].

Macauley et al. [15] found that a group of 211 similar individuals with UI had anxiety scores higher than the general population. One quarter of them had their lives made intolerable by the UI. Others have found subsets of community dwelling UI patients with severe anxiety and depression [16].

UI is an important risk factor for the development of pressure sores [17] and also retards their healing [18].

In patients with unrecognised chronic retention of urine or who have been fitted with an indwelling urinary catheter, symptomatic urinary infections may result [19]. Prevalence surveys in Danish institutions have shown that between 1978 and 1991, during which time efforts had been made to restrict the use of indwelling urethral catheters, the percentage of UTIs associated with their use had halved. Condom drainage systems, however, remained a significant risk factor for UTIs [20].

Much has been written about nocturnal lower urinary symptoms in American NHs (nocturia, nocturnal polyuria, nocturnal incontinence). These problems may contribute to skin problems, falls during attempts to visit the lavatory and sleep disruption [21–24].

Urinary incontinence has been shown to substantially increase the risk of admission to a NH, but appeared to have little effect on total mortality [25].

Staff morbidity

One of the problems of dealing with UI is the attitude of the care staff. Nurses may feel guilty and inadequate when they are unable to meet all of their residents’ needs.

These feelings may worsen when it is clear that the volume of these needs is too much for the manpower available. Burnout has been described [26, 27].

Diagnosis and assessment of UI in NHs

Reversible factors which may cause UI can be recalled using the mnemonic DRIP (delirium, restricted mobility, retention, infection, inflammation, impaction, polyuria, pharmaceuticals). Identification and management of these reversible conditions can reduce the severity of UI and make it more manageable.

Assessment of the pathophysiology of UI in institutionalised older individuals has been performed almost entirely in North America. Resnick et al. [28], for example, performed multi-channel video-urodynamics on 94 of 245 incontinent NH patients. He showed that detrusor overactivity was the predominant cause in 61% with associated impaired detrusor contractility in half of those. Other diagnoses in females were genuine stress incontinence (GSI) in 21%, underactive detrusor in 8% and outlet obstruction in 4%, 29% of men had evidence of outlet obstruction and 35% of both sexes had more than one diagnosis.

In 1991, Dennis et al. [29] reported on the evaluation of 155 older female NH residents using simple cystometry (simple water cystometry using incremental bladder filling by gravity).

The patients were classified into five groups: normal 42%, detrusor instability (DI) with urgency 15%, DI without urgency 22%, stress incontinence 17% and overflow incontinence 4%. The patients with normal cystometry revealed a strong correlation with moderate to severe cognitive impairment. Although on follow up evaluation 13 weeks later, 33% of residents had a different urodynamic diagnosis; it was felt that this technique was reliable in identifying patients with overflow incontinence (who might benefit from clean, intermittent catheterisation) and possibly with stress incontinence.

In Britain, there is little written about the assessment and diagnosis of this group of patients. However, in 1986 Tobin and Brocklehurst [30] looked at residential home (RH) residents and using history from staff and residents, full physical examination, simple investigations including: catheter specimens of urine (CSU), post void residual and vaginal wall cytology, they arrived at the following diagnoses in the incontinent residents: unstable bladder – 73.8%, unstable and GSI – 18.6%, GSI – 3.4%, voiding disorder – 1.4%, UTI – 34% and atrophic vaginitis 21%. Some individuals had more than one diagnosis.

The appreciation that there are a variety of causes for UI in these patients has led to the employment of different therapies (see below). However, it is not easy to routinely employ detailed or even simple cystometry in such a frail and dependent group of patients. A more basic form of assessment is required.

NH patients are a heterogeneous group – some are less frail, have rehabilitation potential and would benefit from a more thorough assessment and may benefit from specific treatment. Others may have end stage dementia and would be appropriately managed with containment methods. However, as even severely impaired residents may respond to prompted voiding a bias in favour of thorough assessment and therapeutic trial is appropriate.

Clinical history and physical examination (including stress test [31, 32]) followed by the use of bladder records and simple investigations (e.g. measuring post void residual [33]) may, in some less frail NH patients, diagnose the cause of UI. Bladder records can be performed by less frail patients with minimal help (e.g. the
Direct costs are those concerned with diagnosis, costs related to UI can be classified as direct and indirect. The cost of UI assessment of UI in British NHs suggests that such assessments are rudimentary (21% of homes in one paper compliance encouraged by the system may be counter-productive to innovation in resident care [40]. Nevertheless the degree of success is open to debate and it has resulted in some improvement in quality of care.

**Minimum data set and resident assessment protocol**

In 1987 the United States Congress passed the Omnibus Budget Reconciliation Act which mandated a rational approach to chronic conditions in NHs. As a result, regarding UI, the MDS and the resident assessment protocol (RAP) were introduced [37].

The MDS not only is designed to quantify UI but also to identify conditions that might cause or contribute to it, thereby facilitating individualised care plans.

The RAP proposed a stepwise non-urodynamic approach to determine the urinary tract and non-urinary tract causes of UI. There have been some concerns about the use of MDS scores, for example the variability between direct observational measures of wetness and the MDS, also the clinical utility of MDS continence data in monitoring change in UI severity may be limited [11]. Furthermore, particularly in the 6 months following its introduction, the care staff may spend more time with the new regulations than with basic care delivery [38].

There have, however, also been evaluations which found the MDS to be feasible and reliable when administered by trained staff and the RAP to be diagnostically accurate and safe [39], and also that the MDS is useful in diagnosing transient causes of UI [10].

It has moreover been suggested that the MDS standardised approach to assessment is useful not only for resident care planning and research but also because it has resulted in some improvement in quality of care. Nevertheless the degree of success is open to debate and paper compliance encouraged by the system may be counter-productive to innovation in resident care [40].

The little that has been written about diagnosis and assessment of UI in British NHs suggests that such assessments are rudimentary (21% of homes in one survey had a strategy relating to the admission of incontinent residents) [41]. There is certainly much scope for research into many aspects of the assessment and management of UI in British NHs.

**The cost of UI**

Costs related to UI can be classified as direct and indirect [42]. Direct costs are those concerned with diagnosis, treatment, care and rehabilitation. Less easy to define are the indirect costs of UI which include decreased resident and staff morale.

The financial cost of UI is high. Hu et al. [42] estimated an average cost per incontinent resident of US$4,104 per annum. Estimates of costs need to consider factors such as severity and prevalence of incontinence, nursing time, laundry and incontinence supplies [43]. The greatest direct cost comes from nursing time [42, 44]. The cost of the consequences of UI (e.g. skin irritation, urinary infections, falls) is also considerable [42, 45].

It has not yet been conclusively demonstrated that strategies aimed at reducing the number of incontinent episodes are cost effective [46]. In fact, the cost of keeping an individual dry may be significantly greater than the cost of managing incontinent episodes [47].

Whilst research into the cost effectiveness of UI management programmes in NHs is inconclusive, the main aim of UI management should be to improve quality of life and self esteem of NH residents [43]. A study of NH residents’ perspectives on UI found that many people believe that UI is an inevitable part of ageing [48].

A survey of UI in 80 Leicestershire NHs found that most had a formal policy regarding the management of incontinent episodes, such as use of appliances and pads for containment of UI. However, some aspects of continence promotion including voiding regimens, nighttime toileting, and clear bathroom signs were less well represented. Incontinence management was rated as ‘good’ in less than 50% of homes and continence promotion as ‘good’ in only 30% [41]. Thus it is clear that the rather fatalistic approach of accepting and coping with episodes of UI, rather than promoting urinary continence, is common in the NH setting. However, even physically dependent and cognitively impaired individuals may respond to some of the continence promotion strategies described below.

**Strategies for continence promotion and management of UI**

The choice of strategy will vary depending on the type of UI and on factors relating to the individual’s health [49]. Whichever strategy is chosen, there are common factors to be considered, including communication, odour control, skin care, and regulation of fluid balance [50]. Attention must also be paid to the patients’ physical environment. Various factors such as poor lighting, loose carpets, or inadequately signposted toilet facilities can add to ‘manufactured incontinence’ in the NH [50]. In addition, a review of the subject’s medication is essential. Drugs that may contribute to UI (e.g. diuretics, hypnotics) should be reduced or stopped. Other reversible causes should be addressed (see above).
There is no data to support the treatment of asymptomatic bacteriuria in NH residents with chronic UI [51], although physicians should have a high index of suspicion for symptomatic urinary infection in the presence of non-specific symptoms [52].

Atrophic vaginitis can cause irritant symptoms including UI which may respond to oestrogen therapy [53].

**Behavioural interventions**

Behavioural strategies for elderly patients with UI in NHs include timed voiding, habit retraining, and prompted voiding.

Timed voiding is frequently used [49, 54]. It is effective in cognitively impaired individuals with impaired mobility and urge incontinence. The resident is taken to the toilet at regular intervals throughout the day, although the frequency of toileting should be reduced overnight to improve sleep [55]. The aim is to empty the bladder before unstable contractions cause episodes of incontinence. The patient is toileted even if they have lost urine within the previous hour, as the urine loss may have been caused by an unstable contraction that did not completely empty the bladder. This fixed voiding schedule does not promote self-toileting efforts, and is dependent on nursing staff.

The voiding interval is, of necessity, short (e.g. every 2 h) and this requires a lot of staff time. This has to be balanced against the cost of cleaning up after an incontinent episode [47, 56].

Habit retraining involves assigning the subject initially to a timed voiding interval. The patient is assessed for wetness or dryness at the scheduled voiding time, and observed to see if urine is then voided. The toileting interval is subsequently altered to fit the patient's individual voiding pattern [56]. Thus staff have to keep multiple voiding records, which may be more time consuming than the timed voiding.

If habit retraining can be established, bladder training may then be attempted, whereby the patient is requested to gradually extend the voiding interval. This strategy requires adequate patient cognition and compliance [54, 56], and is therefore not commonly employed in the NH setting.

Prompted voiding (PV) is the behavioural strategy for which there is the most supportive evidence. Most of the work into the efficacy of this regimen has been done in North America. The goal of PV is to encourage people to initiate their own toileting through requests for help and positive reinforcement from carers when they do this. At regular intervals the patient is asked if they are wet or dry. They are then checked for wetness and given verbal feedback. They are asked if they would like to use the toilet and are taken if they respond positively. Verbal positive feedback for dryness and appropriate requests for toileting is given. The usual interval between prompts to void is 2 h. In a multi-phase study involving 41 incontinent NH residents, Burgio et al. [57] found that not only was PV an effective treatment for UI, but also that a less intense 3-h regimen may be superior to the usual 2-h schedule for some people.

All subjects in this trial had cognitive impairment and most had detrusor instability with or without stress incontinence. The available evidence suggests that nighttime PV is not an effective intervention, even in people who respond well to daytime PV [58]. Night-time care should therefore be individualised, based on the subject's preferences, sleep patterns, and willingness to toilet at night.

The Cochrane review [59] of the evidence on PV includes five trials involving a total of 355 subjects. The trials were randomised or quasi randomised, and included men and women, both with and without cognitive impairment, who were diagnosed as UI either on clinical grounds or after urodynamic investigations. The majority of the subjects in these trials were women.

The evidence available suggests that PV increases self-initiated voiding and decreases incontinent episodes in the short term. At present there is no evidence about the long-term effects of PV.

In a study aimed at identifying some predictors of successful PV in NH residents, Ouslander et al. [60] found that subjects who responded well to a three-day trial of PV were more likely to continue to respond well. The degree of cognitive impairment displayed by the subjects and the results of previous urodynamic investigations were not helpful in predicting response to a PV programme.

All of the behavioural programmes outlined above are labour intensive. To be effective they need the involvement and motivation of both residents and staff. The reliance on NH carers’ co-operation for the success of the regimens is well recognised. Various staff management policies and programmes for instituting voiding programmes, particularly PV, have been explored [61–65]. The authors of these reports describe how different methods of supervisory monitoring, staff feedback, and quality control can be used to help sustain voiding regimens in the long-term care setting. There has also been some research into, and development of computer aided ‘Total Quality Programmes’ aimed at sustaining continence promotion efforts [66].

**Drug therapy**

In NH populations where multiple pathologies exist and polypharmacy is to be avoided, drugs for UI may be contraindicated. However, there are circumstances in which they may be used in combination with other continence promotion strategies. In a randomised, placebo controlled, double blinded crossover trial the effects of adding oxybutynin to a PV regimen were explored for patients with bladder instability. The trial, concluded that
a therapeutic trial of oxybutynin might be reasonable for some subjects who do not respond well to PV alone. Anticholinergic side effects of oxybutynin may exacerbate UI [67].

For women with GSI a combination of oestrogen and an alpha-agonist has been suggested [52, 56]. Although licensed in the United States, alpha agonists are not licensed in Britain for this indication. The addition of timed voiding will keep the bladder volume low, and if the subject can co-operate, pelvic floor exercises should be introduced. The number of NH residents able to comply with pelvic floor exercises is much lower than that in the community.

Eradicating bacturia in otherwise asymptomatic NH residents with chronic UI had no short-term effects on its severity and was not supported as a strategy [68].

A study of arginine vasopressin (AVP) levels in NH residents with nocturnal UI and nocturnal polyuria found a deficiency in AVP production and/or secretion.

However, the routine use of exogenous AVP for such residents was not recommended before the pathophysiology of these symptoms is better understood [69].

**Containment of UI**

The use of absorbent pads and undergarments [70] in UI in NHs is common. These should not be used as an alternative to continence promotion efforts but as an adjunct. Where pads are worn attention must be paid to the maintenance of skin integrity. There is a wide variety of padded garments available, both disposable and reusable. The choice of padding depends on factors including patient preference, the frequency and severity of episodes of UI, and the patient's size, mobility, and activity [49]. Although some find it embarrassing to wear pads, others feel more comfortable [51].

**Urine collection devices**

External urine collection devices are frequently used for NH residents with refractory incontinence. For men a type of condom connected to a drainage system may be used. Where the penis is retracted a special pouch is available. The number of NH residents able to comply with pelvic floor exercises is much lower than that in the community.

Intermittent catheterisation may be used in overflow incontinence, which has not responded to other measures. This technique is more widely used in the community than among the NH population. The majority of NH residents in whom this method is used is dependent on nursing staff to perform the procedure. This technique is time consuming and expensive, but reduces the risk of nosocomial infection when compared with a permanent catheter.

Continuous indwelling catheterisation should be used as a last resort in subjects with chronic refractory UI or in terminally ill patients for comfort reasons [49]. In patients with long-term catheters bacteriuria is inevitable, and urinary tract infection is common, the consequences of which include bacteraemia, pyelonephritis, renal impairment, bladder cancer and death [46]. Where indwelling catheters are used, meticulous attention to catheter care is essential to minimise complications.

**Key points**

- At least 50% of nursing home residents in the Britain and North America suffer with urinary incontinence.
- It is associated with resident and staff morbidity.
- Assessment should be tailored to the capability of the resident. The minimum data set and resident assessment protocol may be reliable tools for the assessment of incontinent residents.
- Behavioural interventions are more likely to be beneficial than drug treatment.
- Proper management in this setting is very labour intensive.

**References**

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