Lifestyle interventions for UI in women

BY JAY KHASTGIR

Lifestyle interventions for urinary incontinence (UI) are supported by all major guidelines. The National Institute for Health and Care Excellence (NICE) guideline (CG171) from September 2013 (updated November 2015) [1] recommends lifestyle advice including dietary modifications such as caffeine reduction, fluid intake management, weight loss, and bladder training as first-line measures for management of urinary incontinence, alongside patient education. This is echoed in recommendations by the International Consultation on Incontinence recommendations [2], European Association of Urology (EAU) guidelines [3] and others. A conservative first-line approach offers patients the potential for symptom improvement without subjecting them to the risks inherent in surgery or side-effects from pharmacotherapy. The recent focus on mesh-related complications following pelvic surgery in the media and medical literature has brought into sharp focus the need for a return to safer, less invasive treatment options using first principles.

There is much to be gained by having a strong focus on conservative management options as the successful outcomes from these measures may be considerable. These strategies are safer and more cost-effective. Furthermore, good quality information and support of patient education and awareness is likely to empower patients to be involved in their own care. An understanding of how each measure is likely to help and the anticipated magnitude of benefit may improve compliance with treatment. The aim of this feature article is to provide a summary of the key evidence base and theoretical rationale for the recommendations for lifestyle interventions.

Definitions and the scale of the problem

Urinary incontinence (UI) is a common problem in women of all ages. Defined by the International Continence Society as "the complaint of any involuntary leakage of urine", it is estimated to have high prevalence rates of 12% to 42% in younger and middle-aged women and 17% to 55% in older women. Some estimates from residential care homes place the prevalence figures at around 70-80% [4]. The true burden of UI is very likely underestimated because of poor awareness, lack of disease recognition and reporting, and missing or incorrect diagnosis. This also explains why, to some extent, prevalence figures quoted vary so much.

UI is one of the geriatric giants as it becomes very common in the elderly with an extremely high prevalence, afflicting a population that is particularly vulnerable because of their frailty, comorbidities, polypharmacy and functional impairments of both cognitive and physical varieties. This subgroup of patients is particularly vulnerable to the adverse effects of what is often termed the 'anticholinergic burden', such as increased risk of falls, cognitive decline, constipation and blurred vision.

The most prevalent types of urinary incontinence are stress urinary incontinence (SUI), urgency urinary incontinence (UUI) and mixed incontinence (MUI). Stress urinary incontinence refers to involuntary urine loss on effort or exertion or on sneezing or coughing. Mixed urinary incontinence is when involuntary urine leakage occurs with both urgency and exertion. MUI is a particularly challenging and complex problem as interventions aimed at improving one component may not help, or could worsen, the other component. In the EPINCONT study, a Norwegian population survey including 27,936 women the prevalence of UUI was 11%, 50% for SUI and 36% for MUI [5]. The EpiLUTS cross-sectional study from the USA, UK and Sweden found a prevalence in women of 24.4% for UUI and 31.8% for SUI [6].

What lifestyle advice works?

Restriction of fluid intake

'Normal' fluid intake and lower urinary tract function is difficult to define, and seem to be dependent on age, gender, social influences / culture, race and geography. NICE advises modification of high or overly low fluid intake in patients with overactive bladder (OAB) or UI without defining what is high and low. Admittedly, there is a lack of good quality evidence on this subject and consequently it is difficult to advise what is 'not enough' or 'too much'. A study from Bristol suggests that drinking >3l of fluids would be excessive and increase lower urinary tract symptoms (LUTS) whereas drinking <1l may cause dehydration with consequent symptoms such as headaches and constipation [7].

There is no consensus on how to practically advise patients with LUTS: some practitioners advise patients to increase fluid intake on the basis that concentrated urine has anecdotally been associated with increased urgency episodes, whereas others advise fluid restriction.

Despite fluid intake manipulation to control LUTS being widely practised, there are few randomised controlled trials (RCT) on the effect of this on OAB / SUI. In one small prospective, cross-over trial from Bristol, 24 adults were instructed to either increase or decrease their fluid intake by 25% and 50% from baseline (the baseline was established from a four-day screening period using frequency / volume charts). The authors reported a significant improvement in symptoms when the fluid intake was reduced by 25% (a target that patients adhered to well), with a reduction of daytime frequency by 23%, urgency by 34% and nocturia by 7%. The converse was seen when patients increased their fluid intake, although this had no effect on urgency and nocturia [8].

On the other hand, a recent analysis of hydration status based on urine osmolality from a database of 11,482 men and women from a US cross-sectional population survey concluded that hydration status was not associated with moderate to severe incontinence [9]. The Leicestershire MRC Incontinence Study found no association between total fluid intake and either OAB or SUI on multivariate analysis [10].

A Cochrane Review in 2015 showed limited, low quality evidence to suggest symptom-specific quality of life scores improved when fluid intake was reduced [11].

It should be remembered that there is always some difference between fluid intake and urine output when measured, which reflects the water content of food (such as in vegetables and fruit) – thought to be about 500ml per day – apart from variations in fluid retention.

What about women with stress urinary incontinence? The earlier Bristol study [7] included 39 women with urodynamic SUI who reported significant decrease in wetting episodes when fluid intake was decreased. A drawback of this study is that it based its selection criteria on urodynamic findings rather than clinical diagnosis. Having a high

fluid intake in this group of patients who do not void frequently enough may also worsen SUI from the effect of physical exertion on a very full bladder. In this group of women, a combination of timed voiding with a more moderate fluid intake may be beneficial.

Consequently, it seems reasonable to advise fluid restriction to a degree such that fluid intake should be sufficient to avoid thirst, complications of dehydration or an overly concentrated urine. This should be combined with advice on the type of fluids taken.

Types of fluids

It is common to encounter patient reporting worsening or improvement of symptoms depending on what kind of fluids have been consumed. Let's look at what we currently know about this:

- Carbonated (fizzy) drinks: one four-week crossover study on 28 normal volunteers found a significant increase in urgency scores, daytime frequency of micturition and nocturia with consumption of Diet Coke and Caffeine-Free Diet Coke compared to carbonated water and Classic Coke. This may suggest that it is the artificial sweeteners that may be the cause of the problem rather than the caffeine in the drink [12]. In the Leicestershire MRC Incontinence Study, consumption of carbonated drinks was associated with significant increased risk for the onset of both OAB and SUI [10,13].
- Caffeinated drinks: caffeine is an alkaloid known as 1,3,7-trimethylxanthine. It is stimulant which is very commonly consumed across the world. It is found in coffee, tea, green tea, carbonated drinks such as Coke, chocolate and a variety of medications such as analgesics, appetite suppressants, diuretics, and decongestants. Caffeine may increase bladder muscle contractility by increasing intracellular calcium [14,15] and activation of TRPV1 ion channels in rat sensory neurons which have been implicated with normal afferent function and generation of urgency. Chlorogenic acid (CGA) is another phenolic compound found in coffee which inhibits acetylcholinesterase and so may in theory slow acetylcholine breakdown. Furthermore, caffeine has diuretic properties. Even though the clinical association between coffee and urgency / UI is commonly reported by patients, the link between symptoms and caffeine is not that clear or consistent in research. The Leicestershire MRC Incontinence Study did not find an association between caffeine intake and OAB / SUI [10]. The EPINCONT study found a positive association between coffee consumption and OAB but a negative one with SUI [5]. There are two studies which have demonstrated a dose response effect for caffeine. Data was collected from 65,176 women without incontinence in the Nurses' Health Study and Nurses' Health Study II with prospective recording of incident incontinence and caffeine intake over a four-year period. This found a modest but significantly increased risk of OAB and UI at least weekly in women who consumed high amounts (>450mg) of caffeine, but did not find an effect on SUI. Overall, the evidence suggests that reduction of caffeine intake does not, at least to any significant degree, improve UI, but may improve symptoms of urgency and frequency of micturition.
- Artificial sweeteners: it has been hypothesised that artificial sweeteners may lead to increased detrusor overactivity [16], and the crossover study on carbonated drinks described above suggested a similar conclusion [12].

Dietary constituents

The large prospective Leicestershire MRC Incontinence Study [10] showed the increased consumption of vegetables, chicken and bread are associated with a reduced risk of onset of OAB, and bread is also associated with a reduced risk of SUI. Vegetables and bread provide 26% and 30% of fibre in the UK diet; low fibre content of the diet is associated with chronic constipation and straining, with consequent effects on the neurological function of the pelvic floor. There was no correlation with consumption of total meat and OAB or SUI; the significant protective association was confined to chicken.

Of the various micronutrients in our diet, there is a suggestion that low vitamin D status may be significantly associated with OAB, and to a lesser degree retinol and the B vitamins niacin and B6. Conversely, a diet high in vitamin D, B vitamins and retinol was associated with reduced risk of onset of OAB. A similar beneficial effect was seen with a higher potassium intake [13]. Low vitamin D levels are associated with various chronic conditions and muscle wasting is a feature of osteomalacia. However, the precise role of vitamin D in the detrusor function needs further research. Niacin is involved in energy metabolism and vitamin B6 has an essential role in amino acid metabolism.

We are still in the early stages of understanding the relationship between dietary and nutritional composition and OAB / UI. The data we have is very interesting, but poses more questions than answers; how exactly do these dietary components influence lower urinary tract function? How can we advise our patients based on what we know? Vitamin D is produced photochemically in the skin by exposure to UV light, and is also found in fortified fat spreads, cereals and oily fish. Bread and chicken contribute a sizeable amount of niacin in the diet. B6 is widely distributed in foods but are plentifully found in vegetables. Potassium is also widespread in the diet and is most sourced from fruit and vegetables and refined grains. So, this takes us back to basic common-sense medical advice: have a balanced diet with plenty of fruit and vegetables, fibre, chicken and bread, and get lots of sunshine!

Smoking cessation

The EAU guideline acknowledges that smoking cessation does not have a definite effect on UI but gives a Grade A recommendation for cessation advice. There is weak (Level 4) evidence that stopping smoking may improve SUI [17]. The magnitude of effect on reduction of symptoms is not clear. Common sense advice to a chronic smoker with a smoker's cough when she reports urinary leakage from frequently coughing would be to stop smoking, apart from it being good medical advice and a generalised public health measure.

Physical activity

This may be a difficult one to advise women on. Whilst it is commonly reported that physical exercise such as sport, heavy lifting, dancing, trampolining, etc. is associated with or can worsen SUI and sometimes OAB, weight loss and reinforcement of the pelvic floor muscles have been demonstrated to improve UI. Prospective cohort study evidence suggests moderate physical activity decreases the risk of onset of UI in middle-aged and older women and that low physical activity levels are associated with the development of the overactive bladder [3,18-20].

Exercise advice should ensure that the type of exercise does not lend to further stress on the pelvic floor by teaching women the importance of core muscle strength enhancement, correct posture and avoidance of physical stress on the pelvic floor. This will be addressed in greater detail in a future review on behavioural and physical therapies.

Avoiding constipation and straining

There is strong evidence that constipation is associated with UI; chronic straining associated with constipation may be a risk factor for development of UI, possibly by increasing the latency time of the pudendal nerve. This nerve supplies the pelvic floor, hence the proposed causal effect. Lack of fibre in the diet has been found to be associated with OAB and SUI

[10] and may be corrected by simple dietary modifications. Although constipation is commonly found in patients with UI, the EAU found no evidence that treating constipation alone will improve UI (level of evidence 4) and gave it a Grade C recommendation [2]. One RCT reported reduction in UI with a multimodal approach in elderly patients, including assisted toileting, improved fluid intake, etc.

Weight Loss

Obesity or being overweight is an established risk factor for UI, and the prevalence of both UUI and SUI increases proportionately with increasing body mass index. Overweight women who lose 5-10% of their body weight can expect significant improvement in SUI. Obesity is a risk factor which increases the risk of SUI by a factor of three or four. Two large trials have shown substantial improvement in incontinence symptoms after weight loss. In the Programme to Reduce Incontinence by Diet and Exercise (PRIDE) study an average loss of 8% of body weight was associated with a 58% weekly reduction of SUI episodes. Weight loss was not the only factor in this study though, as both the study and control groups were provided with instructions on pelvic floor strengthening and incontinence suppression techniques. The Action for Health in Diabetes (AHEAD) study of 2739 women found women in the study group to be less likely to develop new SUI symptoms; women who lost 5-10% of their body weight were 33% less likely to report weekly SUI; this improved to a 41% reduction in those who had lost >10kg. The investigators calculated that each kilogram of weight loss was associated with a 3% reduction in the odds of experiencing weekly SUI [19-21].

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TAKE HOME MESSAGES

- Lifestyle changes are a safe and cost-effective way of initially managing urinary incontinence and OAB.
- Time spent on making sure patients understand the basis for such recommendations may improve compliance with treatment and improve outcomes.
- A combination of strategies is more likely to be effective.

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Declaration of competing interests: None declared.