Management of nocturia: overcoming the challenges of nocturnal polyuria

ABSTRACT

Nocturia may be a multifactorial condition and should be regarded as a syndrome rather than a diagnosis, with many factors contributing to the clinical presentation. The effects of sleep deprivation can have a severely detrimental impact on the quality of life and productivity of the working age population, with considerable economic implications. Patients are unlikely to seek an appointment with their GP complaining of nocturia – they are more likely to complain of the effects of the condition, such as chronic tiredness, or injuries resulting from falls. The main criterion in deciding whether a patient should undergo further investigations into suspected nocturia is the degree to which the patient finds the condition bothersome. In some patients, lifestyle modifications may be an effective way to manage nocturia before medication is considered. As the only licensed product for all adults including those over 65 years of age, low dose desmopressin (Noqdirna® (as lyophilisate) Ferring Pharmaceuticals Ltd) is highly effective in the management of idiopathic nocturnal polyuria, producing improvements in clinical symptoms, sleep parameters and quality of life. Care should be administered as a joint enterprise between the patient's GP and colleagues in secondary care. This article outlines the findings of a roundtable discussion into the optimal management of patients with nocturnal polyuria.

Nocturia is defined by the International Continence Society as 'the number of times urine is passed during the main sleep period, with each urination followed by sleep or the intention to sleep (Hashim et al, 2019). It is a highly prevalent condition that affects 2–18% of those aged 20–40 years, rising to 28-62% for those aged 70–80 years (Oelke et al, 2017). Indeed, it is so common that most patients and, perhaps, the majority of clinicians do not recognise it as a medical problem. It is often accepted as a natural consequence of ageing, with the result that it is often poorly diagnosed and inadequately treated.

Patients who wake to void multiple times each night will experience disruption to their early stage slow wave sleep that has vital restorative effects (Diekelmann and Born, 2010). Chronic sleep deprivation is associated with poor daytime functioning and impairment of memory and cognitive performance (Ancoli-Israel et al, 2011). The effects of sleep deprivation can have a severely detrimental impact on the quality of life and productivity of the working age population, with considerable economic implications. An individual suffering from nocturia will lose an average of seven working days a year compared with colleagues with a healthy sleep pattern. Hafner et al (2019) estimated the impact of nocturia in six countries (Australia, Germany, Japan, Spain, UK and USA) to be worth $79 billion (£63 billion) in lost economic output. In the UK they estimated that 9.1 million people may be affected by nocturia at a cost to the national economy of $5.9 billion (£4.7 billion). The authors concluded that 'given the substantial economic implications of untreated nocturia, this should be a wake-up call to diverse stakeholders – including patients, healthcare providers, and employers – of the importance in identifying and treating nocturia.' Information and resources for patients and health-care professionals can be accessed at www.nocturia.co.uk.

Chronic sleep deprivation has also been linked to significantly poorer health outcomes, resulting in a weaker immune response and increased risk of cardiovascular disease, anxiety and depression (Dinges et al, 1997; Newman et al, 2000; Buysse, 2004; Carskadon, 2004; Ancoli-Israel et al, 2011). Frail older patients may sustain injury as a result of falls that occur when going to or from the toilet at night (Nakagawa et al, 2010). Lack of slow wave sleep may also produce changes in glucose metabolism that contribute to an increased risk of type 2 diabetes (Tasali et al, 2008). Overall, the various adverse effects combine to increase the mortality rate in patients with nocturia, with a direct correlation between risk of early death and the average number of times that the patient has to get up to void (Nakagawa et al, 2010).

Clinical presentation

Specific concerns about the number of times they need to get up to void at night are unlikely to be the reason why a patient seeks an appointment with their GP. They are more likely to complain of the effects of the condition, such as chronic tiredness, or injuries resulting from falls.

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The consequences of injury are likely to be more serious in the elderly population than younger patients. Nocturnal polyuria could be considered as a potential explanation for falls in this patient group as increased incidence of this condition in elderly patients may be exacerbated by a number of other risk factors such as loss of muscle mass, the effects of drug treatment for comorbidities, and age-related sensory and cognitive impairment.

Traditionally, when nocturia has been suspected, the patient will have been referred for a urological assessment on the grounds that the condition was likely caused by an overactive bladder, or some form of obstruction, such as benign prostatic enlargement. More recently it has become clear that nocturia may be a multifactorial condition and should be regarded as a syndrome rather than a diagnosis, with many factors contributing to the clinical presentation – urological, renal, hormonal and cardiovascular. Patients may also need to be assessed to identify factors such as sleep abnormalities (notably obstructive sleep apnoea syndrome) and behavioural anomalies, particularly polydipsia. As a result, appropriate diagnosis and treatment may require a multidisciplinary approach.

The most common cause of nocturia, occurring in approximately 88% of patients (Oelke et al, 2017), is nocturnal polyuria. Nocturnal polyuria is defined as the production of an abnormally large volume of urine during sleep – more than 33% of daily output in older patients and more than 20% in adults under 35 years of age (Van Kerrebroeck et al, 2002). The cause of nocturnal polyuria is always outside the urinary tract, i.e. systemic. Where no obvious cause is apparent (e.g. no obvious peripheral oedema, sleep apnoea, excessive fluid intake in the evening) then it can be assumed that nocturnal polyuria is idiopathic. It is now well recognised that the decreased nocturnal secretion of arginine vasopressin is frequently the cause of this 'idiopathic' nocturnal polyuria. Idiopathic nocturnal polyuria is readily treatable with low dose desmopressin, a synthetic analogue of arginine vasopressin.

Another group of nocturia patients in whom currently available treatments may have considerable benefits are those with obstructive sleep apnoea syndrome. While there is a clear link between obesity and airway obstruction, the condition can also affect those with a normal bodyweight. Any patient with a body mass index of 30 kg/m^2 or more should be questioned about their sleep patterns (and their partner's). If obstructive sleep apnoea syndrome appears likely, the patient should be referred for a sleep clinic assessment for their suitability for continuous positive airway pressure therapy.

The main criterion in deciding whether a patient should undergo further investigations into suspected nocturia is the degree to which the patient finds the condition bothersome. However, this is an entirely subjective assessment as patients show considerable differences in their willingness to accept disturbed sleep and its consequences. If the symptoms are regarded as inevitable, then the patient may be reluctant to seek medical help and so a key priority for health-care professionals will be to educate patients about the aetiology and management of the nocturia.

Training may also be necessary for GPs and many generalist colleagues in secondary care to correctly identify and treat these patients effectively. An online learning module for all health-care professionals involved in the multidisciplinary care of these patients is available at http://elearning.rcgp.org.uk/nocturia.

Both GPs, and most generalist physicians in secondary care, will have received little specific training in urology. Indeed, some information imparted to previous generations of medical students may have contributed to the lack of understanding of the impact of nocturnal polyuria. Many physicians will have been told during their undergraduate studies that one night-time void is normal in those aged up to 70 years old with one additional visit for each subsequent decade of life. However, there is no evidence of any direct link between patient age and voiding frequency. One toilet visit a night would be acceptable for most healthy adults, but more than twice will start to cause significant sleep disturbance. The ability of the patient to get back to sleep may be influenced by the distance and degree of difficulty that the patient has in reaching their bathroom. The need for more visits to the toilet may increase the risk of injury as a result of falls. There is also a need to increase patient awareness of this condition, as many believe that excessive voiding at night is just a symptom of old age and hence may not mention this to their GP.

Investigations

Before devoting time and resources to nocturia investigations, it is important to rule out simple lifestyle choices or the impact of already prescribed medications (such as calcium-channel blockers) as the cause of nocturia. Excessive fluid intake, especially before sleep, is a common contributor to nocturia. Patients who drink copious quantities of fizzy drinks, alcohol or coffee late at night will also need to adjust their intake.

Until it was identified as the loss of circadian rhythms in arginine vasopressin secretion, nocturnal polyuria was generally described as idiopathic, and that term may still be used today.

Simple baseline tests will usually be available in primary care: full blood count, liver function, kidney function, bone profile, fasting blood glucose, glycated haemoglobin, thyroid function tests, dipstick urinalysis, blood pressure, ultrasound scan of the renal tract to measure residual volume and prostate-specific antigen in older male patients. The International Continence Society consensus (Everaert et al, 2019) recommended a pelvic examination in female patients with nocturia, but there was no agreement on the value of digital rectal examinations in males.

More complex investigations are typically guided by the specific clinical presentation and require a multidisciplinary approach, with the GP working with secondary care specialists in various disciplines. GPs will normally be the first point of contact in the patient pathway and

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will likely take overall responsibility for managing the multidisciplinary team that may be required to provide appropriate diagnosis and treatment for nocturia. However, the time pressures resulting from an average 10-minute appointment slot create challenges for GPs when dealing with such a complex multifactorial condition.

The patient's GP will be able to provide information on the potential influence of concomitant medications that may have an impact on nocturia (*Table 1*).

Nocturia can be an important factor in more than half of those patients (often but not exclusively female) who report clinical symptoms of overactive bladder syndrome. The latter condition is associated with increased urinary urgency, frequency and urinary incontinence in the absence of infection or other obvious pathologies (Haylen et al, 2010). Therefore, the clinical pathway for investigating overactive bladder follows most of the steps that would be necessary in nocturia cases. History, physical examination and bladder diaries would be followed up by further investigations, such as urine culture, renal function, full blood count and glycated haemoglobin as needed, depending on differential diagnosis. These may be performed in primary care although, should symptoms be refractory or persistent, then patients may benefit from referral to secondary care for further investigations including urodynamics and cystoscopy. Referral to secondary centres would also be necessary for investigations into the various renal and cardiovascular factors associated with oedema and resulting nocturia.

There is a particular subset of patients, non-dipping hypertensives, in whom the normal nocturnal fall in blood pressure is absent. These patients may be particularly susceptible to nocturnal polyuria and should be identified through 24-hour non-invasive ambulatory blood pressure monitoring, which may also predict a range of other cardiac conditions.

Meanwhile, ultrasonography in the hands of an experienced radiologist or sonographer may be useful for measuring post-void residual urine in those patients with storage problems resulting from an obstruction or detrusor underactivity.

Red flag signs which should prompt input from a hospital specialist (such as a urologist or urogynaecologist) include nocturnal enuresis (bedwetting), persistent urinary tract infection, bladder pain, haematuria or significantly elevated post-void residual volume, particularly when associated with impaired kidney function. Patients with signs suggestive of congestive cardiac failure should undergo a comprehensive cardiac assessment and those with symptoms of sleep apnoea (snoring or daytime hypersomnolence) should be referred to a sleep clinic.

Diagnosis

GPs will normally be the first point of contact in the patient pathway and will likely take overall responsibility for managing the multidisciplinary team that may be required to provide appropriate diagnosis and treatment for nocturia.

Table 1. Concomitant medications that may have an impact on nocturia

Class of drug	Examples
Diuretics	Furosemide, indapamide, bendroflumethazide
Drugs causing oedema	Calcium-channel blockers (e.g. amlodipine)
Steroids	Prednisone, hydrocortisone, dexamethasone
Contraceptive pills	Ethinylestradiol, norethisterone, levonorgestrel
Non-steroidal anti-inflammatory drugs	Ibuprofen, naproxen, diclofenac, celecoxib
Thiazolidinediones	Pioglitazone
Drugs causing nephrogenic diabetes insipidus	Lithium, demeclocycline

However, short appointments make it challenging for GPs to deal with such a complex multifactorial condition.

Following the above initial investigations, a diagnosis of nocturnal polyuria can be identified with a reliable but concise set of initial screening questions. The following list was suggested (see also *Table 2* and *Figure 1*):

1. Do you get up at night to urinate?
2. Does it bother you to have to do this?
3. Do you pass a large volume of urine?
4. Is there urgency, in that you have to rush to get to the loo?
5. Do you also urinate frequently during the day?
6. At your first morning visit, is your urine dark and concentrated or pale and dilute?

In order to rule out other common causes of increased urine output, such as diabetes mellitus, the GP should take a full history, review current medication and perform a full physical examination. It may be difficult for the GP to cover all these issues within a typical 10-minute consultation and so some will arrange double length slots to allow a full discussion. A second appointment may also be necessary to arrange a chaperone for some patients.

The GP will need plenty of time to explain the patient's responsibilities in achieving an accurate diagnosis of nocturnal polyuria. For some investigations, an appointment at a secondary care centre will be necessary but the single most important step should be taken at the GP practice.

Table 2. Key screening questions for nocturnal polyuria

Do you get up at night to urinate?
Does it bother you to have to do this?
Do you pass a large volume of urine?
Is there urgency, in that you have to rush to get to the loo?
Do you also urinate frequently during the day?
At your first morning visit, is your urine dark and concentrated or pale and dilute?

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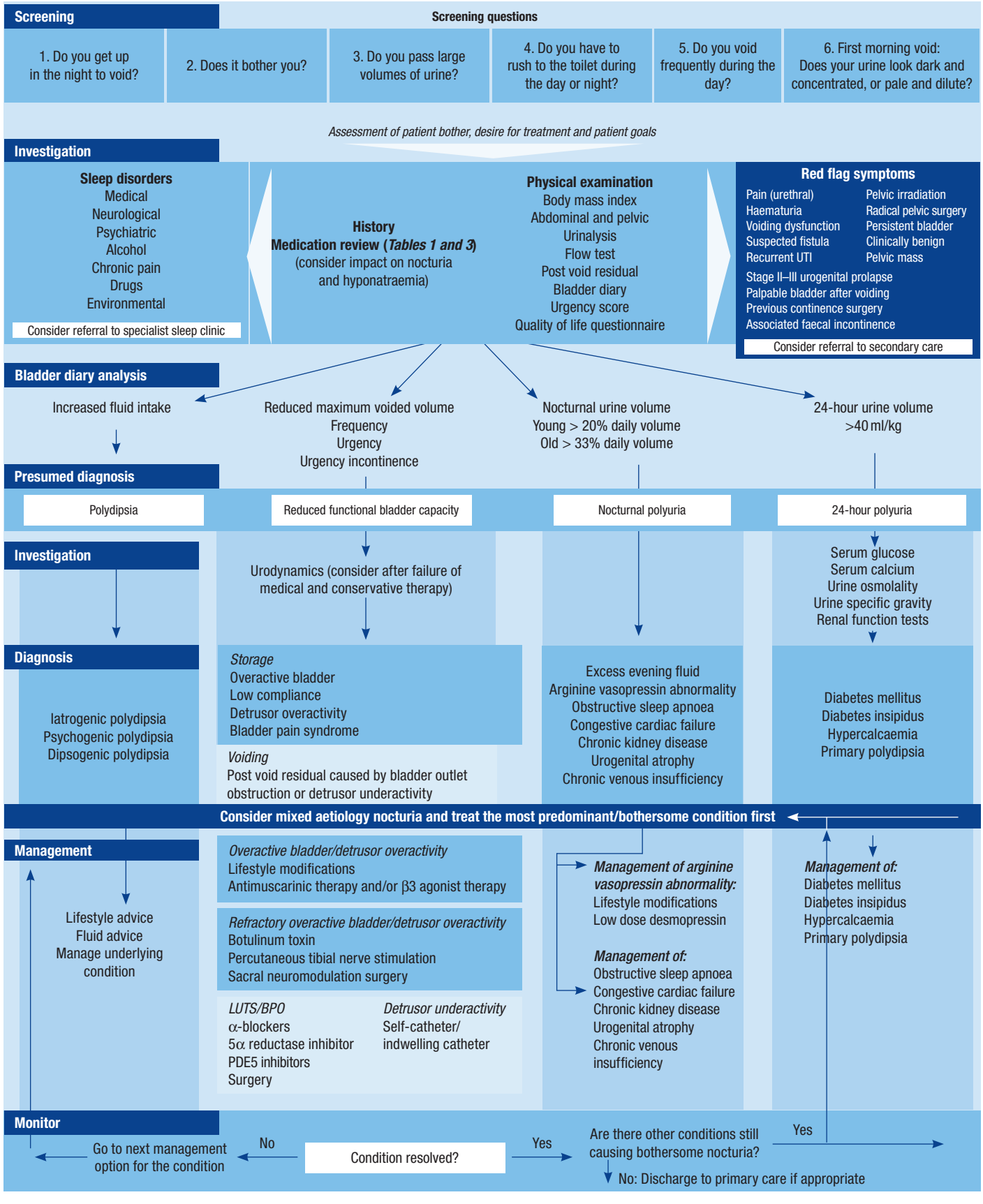
Figure 1. Nocturia pathway. Nocturia definition: symptoms – waking at night to pass urine; sign – the number of times an individual passes urine during their main sleep period. This should be quantified using a bladder diary. BPO = benign prostatic obstruction; LUTS = lower urinary tract symptoms; UTI = urinary tract infection.



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A bladder diary (or frequency volume chart) is an effective but underused diagnostic tool in general practice. When completed properly by the patient it will clearly distinguish between cases of nocturnal polyuria and global polyuria (more than 40 ml/kg/24 hours), and can also identify if other factors are involved such as reduced bladder capacity. This should ideally be completed over a period of 3 days but 2 days of data may prove adequate in some cases. Owing to the difficulties in accurately measuring fluid input and output, it may advisable to ask the patient to complete the diary over a weekend when they will have fewer time commitments. Frail patients and those with cognitive deficits may need assistance from their family or carers to record this information. After the bladder diary has been produced, it is recommended that the patient is invited back for a second double-length GP appointment, to allow a full discussion of the findings and to explain the proposals for further investigations and treatment options.

Various formats are available for the bladder diary but ideally the patient should record fluid intake (including type of fluid), urine output, the degree of urgency accompanying each void, the time and number of visits, the time of going to bed with the intention of going to sleep, and time of the first morning void. A simplified example is shown in *Figure 2*.

Bladder diaries should be completed after the initial assessment in the primary care setting and again if the patient is examined in a secondary care centre, as this may be some weeks or months later. These documents are also useful in reviewing the progress of treatment along each step of the pathway (*Figure 1*) and should be completed after each significant medical intervention.

Management

In some patients, lifestyle modifications may be an effective way to manage nocturia before medication is considered. Under normal circumstances patients should be encouraged to aim for a fluid intake equivalent to approximately 24 ml of water per kg bodyweight/day. A high priority should be given to addressing lifestyle factors that contribute to the effects of nocturia, although physicians should appreciate that in many cases, the adoption of healthier eating and drinking habits may be contingent on the effectiveness of therapies to improve sleep quality.

Nocturia patients should be discouraged from consuming any fluids after, perhaps, 7pm to reduce the capacity for nocturnal urine production. The type of fluid is also important as patients should try to avoid alcohol and carbonated drinks, especially diet drinks with artificial sweeteners such as aspartame and saccharine, which may have bladder irritant effects.

Patients also need to understand that food is an important source of fluid and be encouraged to eat their final daily meal earlier in the evening. Restricting salt intake is a good non-pharmacological approach to managing hypertension and may help with salt diuresis-related nocturia.

Treatment in patients with nocturia will depend on the particular disease phenotype and the clinician's judgement of which aspect of the condition is causing the greatest problems for patients, especially in those with mixed night and daytime symptoms. In patients with predominantly daytime symptoms indicating an overactive bladder, GPs may wish to initiate treatment with antimuscarinic drugs before referral for a secondary centre assessment. If there is no immediate response, then patients should be asked to complete the bladder diary before referral. Lifestyle adjustments (fluid management and sleep hygiene) and adjustment of polypharmacy are important early in the treatment process, particularly in patients with evidence of peripheral oedema. Fluid management rarely cures nocturia, but may improve it,

Figure 2. Example of a bladder diary.

BLADDER DIARY

(Important – please read instructions carefully)

It is very important that you fill in the chart overleaf as accurately as possible over a 3-day period before attending your test.

It is designed to help us take a closer look at your fluid intake and output, and leakage if any. It also helps us to plan the right treatment for you.

For each day, record how much (mls. if possible), what you drink and what time you drink and write it down in the IN column.

When you go the toilet, measure the urine you pass using a jug (mls. if possible) and write it down in the OUT column.

If you leak urine, put an X, yes or √ in the WET column. If you experience urgency, i.e. a sudden desire to pass urine that is difficult to defer, please score 0, 1, 2, 3 or 4 according to the urge score that is described on the next page. Then according to how severe your urgency was please enter the appropriate number in the URGE SCORE column.

TIME	DAY 1			
	IN	OUT	WET	URGE SCORE
07:10 am		140 mls		
08:30 am	250 mls			
10:40 am		90	yes	
12:00 noon		150		2
12:45 pm	200 mls			
02:00 pm		60		0

This means that you passed 140 mls at 07:10 am and had 250 mls of a drink (maybe a cup of tea with breakfast). At 10:40 you leaked urine and passed 90 mls. At 12:00 noon you had 'moderate urgency' with a score of 2 which according to the urgency score means 'you could postpone voiding for a short while without fear of wetting yourself'.

Please write the time you got up and time you went to bed at the top and bottom of the chart for each day. This allows us to see the difference between what is happening during the day and during the night.

(Figure 2 is adapted from a bladder diary kindly supplied by Mr Dudley Robinson, Consultant Urogynaecologist/Honorary Senior Lecturer, Kings College Hospital)

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Table 3. Common drugs that require special warnings and precaution when treating nocturia

Common drugs causing polyuria	Diuretics	Bendroflumethazide
		Furosemide
		Indapamide
		Hydrochlorothiazide
		Chlorthalidone
	Drugs causing oedema	Calcium-channel blockers (amlodipine)
		Steroids
		Contraceptive pills
		Non-steroidal anti-inflammatory drugs
		Thiazolidinediones (pioglitazone)
	Drugs causing nephrogenic diabetes insipidus	Lithium
		Demeclocycline
Common drugs causing hyponatraemia*	Diuretics (see above) Antidiuretics (desmopressin – risk increases with dose) Selective serotonin-reuptake inhibitors (citalopram, fluoxetine) Antiepileptics (carbamazepine) Antipsychotics (clozapine, risperidone) Non-steroidal anti-inflammatory drugs Proton pump inhibitor (omeprazole) Angiotensin-converting enzyme inhibitors	

**Sodium monitoring may be warranted in these patients*

and also gets patients into the habit of minimal fluid intake in the evening so that the risk of hyponatraemia is minimised.

GPs should be aware of the risks resulting from polypharmacy strategies. Treatment with drugs such as amlodipine in patients with elevated blood pressure and with diuretics such as furosemide should be suspended during any initial investigations and used with caution in any subsequent maintenance therapy. Meanwhile, antimicrobials are recommended for patients with some genitourinary disorders such as cystitis and prostatitis, where there is a convincing evidence of a bacterial cause.

As noted already, continuous positive airway pressure therapy and other methods to reduce signs of sleep apnoea are likely to have substantial beneficial effects. Reducing levels of peripheral oedema through the use of elasticated stockings or keeping the legs raised above the horizontal during the evening will reduce the overnight release of fluid into the systemic circulation.

The introduction in 2016 of low-dose desmopressin (Noqdirna®, oral lyophilisate desmopressin acetate, Ferring Pharmaceuticals Ltd), the first gender-specific licensed treatment for nocturia caused by idiopathic nocturnal polyuria, is justification for health professionals to place a much higher priority on investigating, assessing and treating patients with the condition.

Low dose desmopressin (as lyophilisate) is highly effective in the management of idiopathic nocturnal polyuria, producing improvements in clinical symptoms, sleep parameters and quality of life (Sand et al, 2013; Weiss et al, 2013). Idiopathic nocturnal polyuria as a consequence of reduced nocturnal vasopressin is the primary target for desmopressin; desmopressin is not suitable for other causes of nocturnal polyuria such as sleep apnoea, oedema, obesity, hypertension, heart failure and high salt intake (Everaert et al, 2019).

Older patients (over 65 years) need careful monitoring because of the risk of side effects such as hyponatraemia. Serum sodium monitoring is recommended at baseline before initiation of treatment, 4–8 days after initiation and again at 1 month (Ferring Pharmaceuticals, 2016).

Women are more sensitive to desmopressin so a lower dose can be used – 25 µg in women, whereas 50 µg is recommended in men (Sand et al, 2013; Weiss et al, 2013). Patients with borderline low baseline sodium (130–135 mmol/litre) would be suitable for treatment but should be monitored with particular care. Physicians should be aware of other drugs which are known to induce syndrome of inappropriate antidiuretic hormone and may increase the risk of water retention or hyponatraemia (*Table 3*) (tricyclic antidepressants, selective serotonin re-uptake inhibitors, chlorpromazine, diuretics, carbamazepine, non-steroidal anti-inflammatory drugs, oxytocin, loperamide and some antidiabetics of the sulfonylurea group). Furthermore, lithium may diminish the antidiuretic effect and this should be considered (Ferring Pharmaceuticals, 2016).

In severely frail patients with multiple comorbidities, low-dose desmopressin treatment may not be appropriate and a full geriatric care assessment should be carried out before initiating treatment. Those with only mild to moderate frailty could benefit considerably from the quality of life improvements observed with the improved quality of sleep (Sand et al, 2013; Weiss et al, 2013).

Patients must also be warned of the 'sick day rule' requiring the temporary suspension of desmopressin treatment in cases of acute illness resulting in diarrhoea, vomiting and fever which may require an increased fluid intake. Treatment may resume as soon as the signs of acute disease have subsided.

Multidisciplinary management

Nocturnal polyuria is one of the many chronic disease conditions that can and should be managed at the primary care level to free up resources in secondary care. However, to achieve that goal, GPs must receive the education and support needed to provide effective care for people with often complex clinical needs.

Care should be administered as a joint enterprise between the patient's GP and colleagues in secondary care. The focus should be on establishing a multidisciplinary team involving urologists, urogynaecologists, specialist nurses, geriatricians and physiotherapists. Outside the core team, those with the following clinical expertise should be available for individual

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cases: psychiatrists, renal consultants, sleep specialists, endocrinologists, cardiologists and pharmacists. In all cases, patients should have access to specialist continence advisors to provide advice and help in managing their condition.

However, the resources available for the management of these patients may vary considerably between different primary and secondary care organisations around the country. Even in areas such as south Wales, where the system is well resourced and managed, it may not be possible to organise prompt referrals for all clinical disciplines. It is therefore recommended that the various stakeholders aim to set up virtual multidisciplinary teams to provide access to a network of expertise distributed on a more regional basis. The responsibility for identifying the key components of this network and ensuring that the system is accepted and funded by hospital managers may rest with the urology and urogynaecology consultants who normally provide the first link with the primary care practice.

Primary and secondary physicians will have a shared responsibility for monitoring the efficacy of treatment and will need patients to take an active interest in reporting and managing their symptoms. Patients need education about what should be regarded as a normal state – for example, by offering colour-coded charts to indicate the degree of urinary concentration.

GPs should try to monitor the effects of treatment on the patient's quality of life, using a validated method such as the International Consultation on Incontinence Questionnaire (http://iciq.net/). Although not intended as a means of guiding treatment options, this document provides a useful reference for future comparative tests. Health-care providers should also be cognisant of the damaging effects that a condition of this kind may have on the patient's social networks, particularly in younger patients who may have lost their jobs as a result of chronic tiredness. Such patients should be encouraged to contact self-help groups such as Bladder and Bowel UK (https://www.bbuk.org.uk/) to provide reassurance that the patient's experiences are shared by many others. One further suggestion was for GPs to provide forms allowing the patient to reclaim the VAT on incontinence pads which can be a significant expense for those patients not in regular work.

Finally, GPs need to manage the patient's expectations of what can be achieved through the available treatment. Elderly patients are unlikely to regain the bladder function that they had in their youth but being able reduce the average number of nocturnal voids from perhaps six to two per night should make a considerable difference to their quality of life.

Conclusions

Nocturia may be a multifactorial condition and should be regarded as a syndrome rather than a diagnosis, with many factors (including urological, renal, hormonal and cardiovascular) contributing to the clinical presentation. The effects of sleep deprivation can have a severely detrimental impact on the quality of life and productivity of the working age population, with considerable economic implications. Patients are unlikely to seek an appointment with their GP complaining of nocturia – they are more likely to complain of the effects of the condition, such as chronic tiredness, or injuries resulting from falls.

The main criterion in deciding whether a patient should undergo further investigations into suspected nocturia is the degree to which the patient finds the condition bothersome. There is also a need to increase patient awareness of this condition, as many believe that excessive voiding at night is just a symptom of old age and hence may not mention this to their GP. When completed properly by the patient a bladder diary will clearly distinguish between cases of nocturnal polyuria and global polyuria, and can also identify if other factors are involved.

In some patients, lifestyle modifications may be an effective way to manage nocturia before medication is considered. As the only licensed product for all adults including those over 65 years of age, low dose desmopressin (Noqdirna® (as lyophilisate) Ferring Pharmaceuticals Ltd), is highly effective in the management of idiopathic nocturnal polyuria, producing improvements in clinical symptoms, sleep parameters and quality of life. Nocturnal polyuria is one of many chronic diseases that can and should be managed at the primary care level, but GPs must receive the education and support needed to provide effective care for people with often complex clinical needs. Care should be administered as a joint enterprise between the patient's GP and colleagues in secondary care. **BJHM**

KEY POINTS

- Nocturia may be a multifactorial condition and should be regarded as a syndrome rather than a diagnosis.
- The effects of sleep deprivation can have a severely detrimental impact on the quality of life and productivity of the working age population, with considerable economic implications.
- The impact of the disrupted sleep on the patient's daytime functioning, sometimes considered as the degree to which the patient finds the condition bothersome, is the main criterion in deciding whether patients should undergo further investigations into nocturia.
- Appropriate diagnosis and treatment may require a multidisciplinary approach between the patient's GP and colleagues in secondary care.
- There is a need to increase patient awareness of this condition, as many believe that excessive voiding at night is just a symptom of old age.
- A properly completed bladder diary will clearly distinguish between cases of nocturnal polyuria and global polyuria, and can identify if other factors are involved.
- As the only licensed product for all adults including those over 65 years of age, low dose desmopressin (Noqdirna® (as lyophilisate), Ferring Pharmaceuticals Ltd) is highly effective in the management of idiopathic nocturnal polyuria, producing improvements in clinical symptoms, sleep parameters and quality of life.

The pathway in Figure 1 *was developed and reviewed by Mr Dudley Robinson, Consultant Urogynaecologist, Kings College Hospital, London; Dr Sanjay Suman, Consultant Geriatrician, Medway NHS Foundation Trust; Professor Hashim Hashim, Consultant Urologist, Bristol Urological Institute, North Bristol NHS Trust; Mr Talal Jabbar, Consultant Urologist, Royal*

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PRESCRIBING INFORMATION: NOQDIRNA® 25 AND 50 MICROGRAMS ORAL LYOPHILISATE.

Please consult the full Summary of Product Characteristics before prescribing.

Name of Product: Noqdirna 25 micrograms oral lyophilisate; Noqdirna 50 micrograms oral lyophilisate. Composition: 25 or 50 micrograms of desmopressin (lyophilisate as acetate). **Indications:** Symptomatic treatment of nocturia due to idiopathic nocturnal polyuria in adults. **Dosage and administration:** Women 25 microgram daily, men 50 microgram, daily one hour before bedtime administered sublingually without water. **Contraindications:** Hypersensitivity to the active substances or to any of the excipients, habitual or psychogenic polydipsia, known or suspected cardiac insufficiency or other conditions associated with fluid overload, moderate and severe renal insufficiency, known history of hyponatremia, syndrome of inappropriate ADH secretion (SIADH). **Side Effects:** *Very common:* Dry mouth. *Common:* hyponatraemia, headache, dizziness, diarrhoea, nausea. *Uncommon:* constipation, abdominal discomfort, fatigue, peripheral oedema. Treatment with desmopressin without concomitant reduction of fluid intake may lead to water retention/hyponatraemia with or without accompanying warning symptoms of headache, nausea/vomiting, decreased serum sodium, weight gain and in serious cases convulsions. Consult the full Summary of Product Characteristics for further information about side effects. **Special Warnings and Precautions:** Not recommended in patients with cardiovascular or medical conditions associated with fluid overload. Fluid intake must be limited from 1 hour before until 8 hours after administration. Patients 65 years and older should have serum sodium monitored before initiation, in the first week of treatment and at one month post initiation. Discontinue Noqdirna if serum sodium falls below the lower limit of normal. Use with caution in conditions characterized by fluid and/or electrolyte imbalance. Fluid restriction and more frequent serum sodium monitoring must be taken with concomitant treatment with drugs known to induce SIADH. Exercise caution in patients taking thiazide or loop diuretics and in cases of cystic fibrosis, coronary heart disease, hypertensions, chronic renal disease and pre-eclampsia. Severe bladder dysfunction and outlet obstruction should be considered before treatment. Ensure patients taking lithium do not have early-stage lithium-induced nephrogenic diabetes insipidus. **Special precautions for storage:** None. Use immediately after opening individual tablet blister. **Presentation:** Perforated unit dose blisters in a carton. **Marketing Authorisation Number:** 50 micrograms 03194/0119. 25 micrograms 03194/0118. **Marketing Authorisation Holder:** Ferring Pharmaceuticals Ltd., Drayton Hall, Church Road, West Drayton, UB7 7PS. **Legal Category:** POM. **Basic NHS Prices:** 30 x 25 micrograms £15.16. 30 x 50 micrograms £15.16. **Date of Preparation:** July 2018. All trademarks registered to Ferring. PI approval code: NOQ/2109/2016/UK(1)

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