



# The discrepancy between European Association of Urology (EAU) guidelines and daily practice in the evaluation and management of nocturia: results of a Dutch survey

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## Abstract

**Background and objective** In addition to the evaluation of voiding symptoms, in the evaluation of patients with nocturia, one should also consider other related causes such as sleep disorders, obstructive sleep apnoea (OSAS), diabetes and heart failure. In this study, we have aimed to assess the current knowledge and implementation of the EAU guidelines regarding nocturia in common urological practice in the Netherlands.

**Setting and participants** In a national cross-sectional survey distributed among 450 urologists and urology residents in the Netherlands, the implementation of the recommendations of the European Association of Urology (EAU) guidelines on nocturia evaluation and management was studied.

**Results and limitations** This survey revealed that only some aspects of the EAU guidelines are applied in the daily clinical practice and that some important parts are not. For example, only a minority asks about alcohol consumption and symptoms suggestive for diabetes or OSAS. In addition, a majority reported to use a bladder diary for 1–3 days instead of for a minimum of 3 days as recommended by the EAU guidelines. In the management of nocturia, a trial of timed diuretic therapy is only reported by a minority, whereas the use of beta-3 antagonists, which is not mentioned in the guidelines, is applied by a large majority. Desmopressin recommended for nocturnal polyuria is prescribed by two-third of Dutch urologists.

**Conclusions** These observations mandate better education and campaigns to raise the awareness on the EAU-guideline recommendations for nocturia.

**Keywords** Nocturia · Guidelines · EAU · Nocturnal polyuria

## Introduction

Nocturia is a highly prevalent and bothersome lower urinary tract symptom (LUTS), which is defined as the complaint that an individual has to wake at night one or more times to void [1]. The prevalence of nocturia was estimated as

28.4%, 17.6%, and 8.9% for  $\geq 1$ ,  $\geq 2$ , and  $\geq 3$  voiding episodes each night, respectively [2]. Nocturia is considered to be multifactorial and can occur as part of lower urinary tract dysfunction (LUTD), and is often seen in patients affected by the overactive bladder syndrome (OAB), bladder outlet obstruction or chronic pelvic pain syndrome [3].

The EAU guidelines on male LUTS state that when LUTD is diagnosed and considered a causative of nocturia, relevant medications for storage (and voiding) LUTS might be considered. However, effect size of these medications is generally small, or not significantly different from placebo when used to treat nocturia. Applicable medications include selective  $\alpha 1$ -adrenergic antagonists [4], antimuscarinics [5, 6], 5-ARIs [7] and PDE5Is [8].

In addition, nocturia can be an expression of systemic conditions affecting water and salt balance [9], which can lead to global and/or nocturnal polyuria [3, 10, 11]. As nocturia can be a symptom of many conditions such as

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*Patient summary* In a survey, Dutch urologists were asked about how they applied the recommendations made by European guidelines on how to treat patients bothered by nocturia. The study revealed that some important aspects of the guidelines are not applied in the clinical practice.

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bladder storage problems, (global or nocturnal) polyuria, sleep disorders or mixed aetiology, the likelihood of developing a single therapy that can be generalized appears remote [3]. Therefore, nocturia therapy choice needs to consider the specific situation of individual patients. Hence, the evaluation and treatment of nocturia can be complex and was identified by the European Association of Urology (EAU) guideline panel for male non-neurogenic LUTS as a key challenge [3, 12]. Some simplified diagnostic and treatment algorithms have been published that can easily be implemented in clinical practice [12]. It is generally accepted that clinical practice guidelines improve patient care [13]. Previous studies have aimed to assess guideline adherences in clinical practice using non-validated questionnaires to urologists [14, 15]. Studies among urologists have shown that clinical guidelines are used by many urologists, with the EAU guidelines being the most used ones (71–100%) [16]. In many European countries, the EAU guidelines have been adopted and implemented by national urological associations or, alternatively, serve as a basis for the formulation of their own national guidelines by others. The 2017 EAU guidelines on non-neurogenic male LUTS and on urinary incontinence have made several recommendations on the evaluation and management of nocturia.

At present, little is known about practice patterns of urologists in the management of nocturia. In this study, we have aimed to assess the current knowledge and the implementation of the EAU guidelines by Dutch urologists and urology residents regarding the evaluation and treatment of nocturia.

## Materials and methods

A digital nationwide survey on the current strategies used by Dutch urologists in the diagnosis and management of nocturia was sent out digitally to 450 urologists and urology residents in the Netherlands in October 2017. The diagnostic workup of patients with nocturia as well as treatment options applied for nocturia, were evaluated.

In the email sent out to the urologists, we had explained that they could answer for both male and female nocturia. However, the specific male medication (e.g. 5ARI or Tamsulosin) or treatments (TURP) would naturally be referred only to the male population. The vast majority of our questions were not gender specific. For example, the definition of nocturnal polyuria, questions about alcohol consumption, urodynamics, ruling out UTI and bladder diary are not gender specific and apply to both male and female.

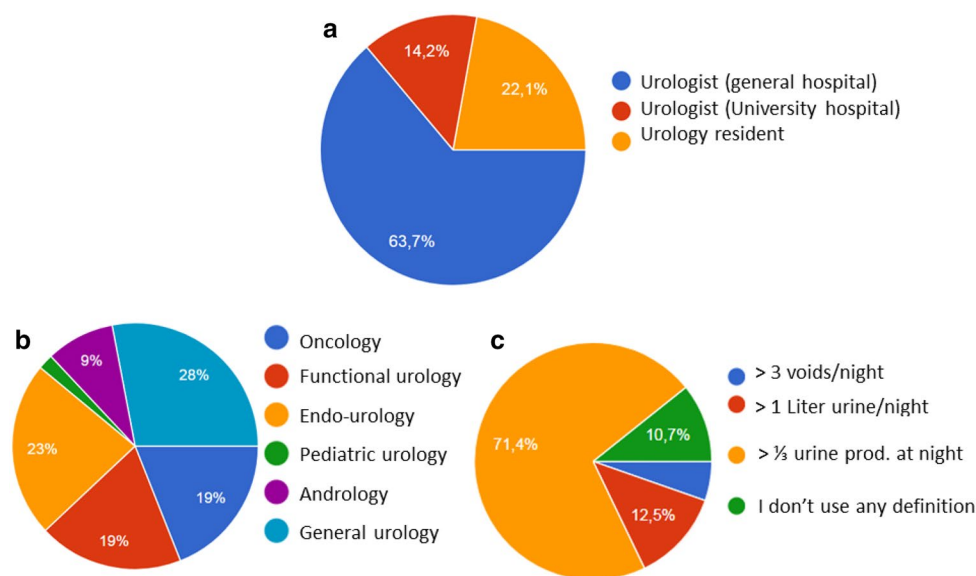
A total of 113 questionnaires were returned and were eligible for analysis.

## Results

The survey had a response rate of 25% and was related to the work setting and field of interest of the participants, the number of patients with nocturia that they see and the questions they ask in patient history taking. The work setting and field of expertise of the urologists are shown in Fig. 1a, b.

During history taking, almost all the urologists reported to ask patients with nocturia about their storage (93%) and voiding complaints (83%), voiding frequency (98%), fluid intake (89%) and symptoms suggestive of heart failure (82%).

**Fig. 1** **a** Distribution of the work setting. **b** Distribution of the field of interest. **c** Definitions of nocturnal polyuria reported



However, questions about sleep disturbances (47%) and alcohol consumption (47%) were only asked by less than half of the participants, when evaluating nocturia patients. Questions about symptoms suggestive for diabetes (38%) or OSAS (36%) were only asked by one-third of the urologists in this survey.

As an adjunct to patient history, voiding diary's (100%), urinalysis (92%) and uroflow (92%) are the most reported used diagnostic tests, followed by laboratory test such as PSA or serum creatinine (50%). Cystoscopy (10%) and urodynamics (2%) were seldom reported to be used in the evaluation of patients with nocturia.

About half of urologists reported to use either a 24-h voiding diary, or a 3-day voiding diary. Nobody reported to use a 5–7-day voiding diary.

The correct definition of nocturnal polyuria, defined as more than one-third of the total 24-h urine production occurring during sleep hours, was reported by 71% of the participants. Surprisingly, 11% of the urologists indicated not to use any definition as nocturnal polyuria would not change their treatment strategy for patients with nocturia (Fig. 1c).

EAU-guideline recommendations on nocturia management were also followed in part. Lifestyle and behavioural changes (e.g. fluid intake, alcohol use) (97%), followed by anticholinergics (93%), alpha-blockers (70%), beta-3-agonists (71%) and desmopressin (79%), were the most frequently applied treatment strategies. Pelvic floor physiotherapy (41%) and diuretics (29%) were less frequently prescribed.

## Discussion

The symptom of nocturia is an important one, since there may be a significant medical cause, potentially an opportunity to screen for undiagnosed or sub-optimally-managed disease, perhaps reduced incidence of severe complication, and potential economic benefits [3].

Although most European urologists claim to apply the EAU guidelines, adherence to them is low in daily practice (Fig. 2).

Although some recommendations about diagnosis and treatment of nocturia originate from the EAU guideline on urinary incontinence, the most recommendations made are mentioned in the EAU guidelines on male LUTS and, therefore, officially apply to men. However, in clinical practice many recommendations for male nocturia will be applicable to female nocturia as well. The specific aim of this study was to determine the knowledge and the adherence of urologists to the EAU guidelines. As there are no official EAU guidelines currently available for female nocturia, our conclusions about guideline adherence only apply to the nocturia treatment in men.

This study shows that although great part of the EAU guideline recommendations are followed by a majority of Dutch urologists in the clinical practice, some important parts are unknown or not followed.

For example, only a minority of the Dutch urologists and residents ask about alcohol consumption and symptoms suggestive for diabetes or OSAS. In addition, the majority of the participants reported to use a bladder diary for either 24 h or up to 3 days. This is despite the EAU guideline grade of recommendation B and level of evidence 2b on the use of a bladder diary for the duration of at least 3 days or even 3–7 days.

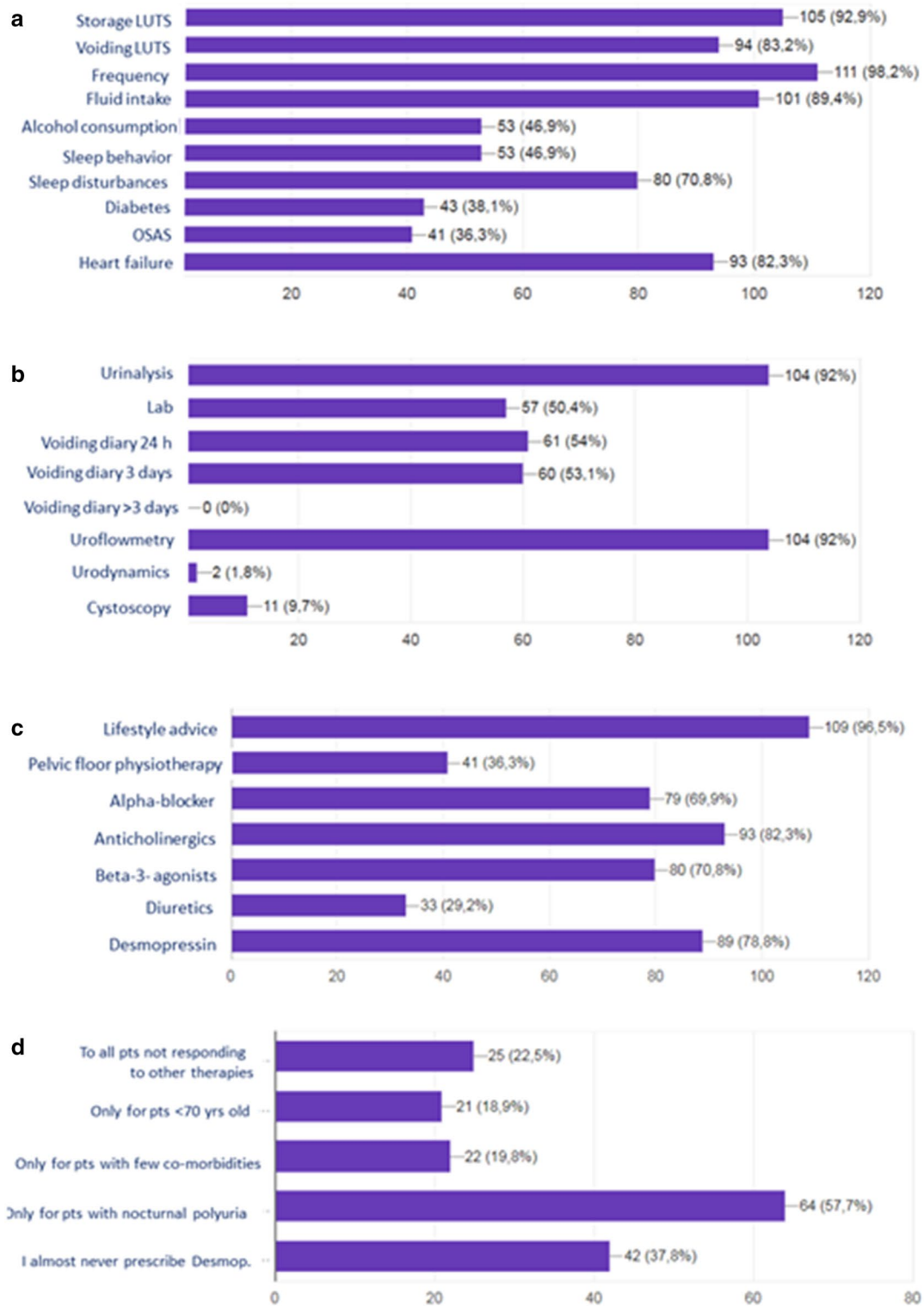
In terms of other items in patient history taking (voiding and storage symptoms, fluid intake and symptoms suggestive of heart failure), there appears to be a fairly good adherence to the EAU guidelines.

Regarding the management of nocturia, almost all Dutch urologists follow the EAU guidelines on discussing lifestyle changes in the treatment of nocturia [Level of evidence (LE) 3—Grade of recommendation GR A]. In addition, both alpha-blockers and antimuscarinics are reported to be used, frequently (LE 1b—GR B). However, a trial of timed diuretic therapy, as recommended by the EAU guidelines (LE 1a—GR C), is only reported by a minority of urologists and urology residents, whereas the use of beta-3 antagonists, which is not recommended by the EAU guidelines, is applied by a large majority of the participants in the clinical daily practice.

Desmopressin has been recommended to be prescribed to decrease nocturia due to nocturnal polyuria (LE 1a—GR A). This recommendation is followed by over two-third of Dutch urologists. However, still one-third reported to hardly ever prescribe desmopressin for nocturia treatment.

Currently, the applied treatment modalities do not improve symptoms in about half of the patients [17]. This might be the result of inadequate diagnostic accuracy leading to a lack of cause-specific therapy, leaving room for improvement through education and treatment guidelines. Furthermore, the diagnosis and management of concomitant and underlying causes such as obstructive sleep apnea syndrome (OSAS), primary sleeping disorders, hypertension and diabetes are often overlooked.

One limitation of this study is the response rate of 25% which might have an influence on our results. Although, a higher response rate would be more preferable, the internal validity of this study is very unlikely to be compromised. Findings, reported by Visser et al. [18], have shown that surveys with lower response rates (near 20%) yielded more accurate measurements than did surveys with higher response rates (near 60 or 70%). In another study, Keeter et al. compared results of a 5-day survey employing the Pew Research Center's usual methodology (with a 25% response rate) with results from a more rigorous survey



**Fig. 2** **a** The results of the survey on patient history. **b** The results of the survey on diagnostic tests. **c** Management strategies applied for the treatment of nocturia. **c** For which patients do you prescribe desmopressin?

conducted over a much longer field period and achieving a higher response rate of 50%. In 77 out of 84 comparisons, the two surveys yielded results that were statistically indistinguishable. Among the items that manifested significant differences across the two surveys, the differences in proportions of people giving a particular answer ranged from 4 percentage points to 8 percentage points [19].

A second limitation is that the survey was conducted in a single European country (The Netherlands) which might not be reflective of the situation in other European countries.

Given the complex nature of the nocturia guidelines, it is difficult to objectively capture and generalize the approach to nocturia among urologists based on our results. Although our results apply to the situation in the Netherlands, it can be concluded that regarding the evaluation and management of patients with nocturia, some important aspects of the EAU guideline on nocturia management are not implemented in clinical daily practice.

A third limitation of our study is that, although most recommendations made in the EAU guideline on nocturia apply to both genders, these recommendations are almost all written in the EAU guidelines for non-neurogenic male LUTS and, therefore, only officially apply to male patients. Hence, all our conclusions apply only to the male population with nocturia.

This observation could be indicative of the clinical practice in other European countries and mandates better education and campaigns to raise the awareness on these matters.

It would be interesting to know the main reasons why physicians do not adhere to the guidelines. We did not, however, conduct follow-up interviews with non-adherent physicians. Therefore, some questions remain to be answered: Do some physicians apply individual experience instead of evidence-based medicine? Do financial motives or scarce resources drive decisions? Does a lack of awareness of guideline changes play a role?

In addition, there will be differences in healthcare systems of the participating countries that we are not aware of, which could influence physicians' decisions. Furthermore, there may be differences because of shared patient management by the urologist and general practitioners in some countries, instead of only the urologist.

**Authors' contribution** MSR: protocol/project development; data collection or management; data analysis manuscript writing/editing. DMJV: data collection or management; data analysis manuscript writing/editing. SH: data analysis manuscript writing/editing. GAK: data analysis manuscript writing/editing. TATM: protocol/project development; data collection or management; data analysis manuscript writing/editing.

## Compliance with ethical standards

**Conflict of interest** None.

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