ORIGINAL ARTICLE

Prevalence of Nocturnal Polyuria in Patients With Benign Prostatic Hyperplasia

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Summary

Nocturia is a common symptom associated with benign prostatic hyperplasia which can persist even after effective treatment of BPH. Other causes may be responsible. We investigated a group of patients who were treated for BPH and continue to have nocturia. Our study has found a high prevalence (85.4%) of nocturnal polyuria in this group of patients. It has important clinical implication since the condition can be effectively treated with oral desmopressin. Empirical treatment without a routine frequency volume chart may be appropriate due to its high prevalence.

Key Words: Nocturia, Nocturnal polyuria, Benign prostatic hyperplasia

Introduction

Nocturia is a common symptom associated with benign prostatic hyperplasia (BPH). Although nocturia may improve with α_1-adrenergic blockers, a significant proportion of patients treated for BPH will still complain of nocturia even with good resolution of the obstructive symptoms. Other condition may be responsible for nocturia in these patients rather than BPH. Since the prevalence of nocturnal polyuria is reported to be 45 – 100% among the community-dwelling elderly individuals[1], we investigate the role of nocturnal polyuria as a cause of nocturia among patients with BPH who do not respond to treatment with α_1-adrenergic blocker.

Materials and Methods

This is a survey of patients with BPH who were followed up at the Urology Clinic, Hospital Sultanah Aminah between July and September 2003. Patients who were treated for BPH with a α_1-adrenergic blocker and still having nocturia were recruited into the study. The weights of the patients were recorded. A frequency/ volume chart over three days was obtained. Patients who were taking a diuretic, who could not understand instructions or unable to record a frequency/ volume chart due to social reasons were excluded from the study. The chart was deemed unsatisfactory if the total voided volume was < 600 ml/ day and if the charting was incomplete.

In this study, we use the definitions adopted by the International Continence Society[2]. Nocturia is defined as waking up at night once or more to void. Polyuria is defined as a 24-h urine volume of > 40 ml/ kg body weight. Nocturnal polyuria is defined as a proportion of the 24-h urine voided at night being > 20 – 33%: this threshold is age-dependent, with 20% for younger subjects and 33% for the elderly. Since our patients come from the older age group, we define nocturnal polyuria as the proportion of 24-h urine voided between 24.00 and 08.00 hours of > 33%, as in most published studies[3-6].

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Results

A total of 49 patients aged between 51 – 78 years old (mean age 66) were recruited. The patients consist of Chinese 29 (59.2%), Malay 16 (32.6%), and Indian 4 (8.2%). The mean duration of treatment for BPH was 18 months (range 1 to 55). The number of voids per night ranges 2 – 5 (mean voids 3.4). The mean peak flow rate (Qmax), with a minimal voided volume of 125 ml was 10.8 ml/sec.

Frequency/ volume charts were found to be unsatisfactory in 8 (16.3%) of the 49 patients and were excluded from analysis. Of the unsatisfactory charts, 3 patients had charted urine output of < 600ml per day, and 5 had incomplete charting.

Analysis of the remaining 41 patients shows that polyuria was present in 4 (9.8%), and nocturnal polyuria was present in 35 (85.4%) of the patients. Two patients (4.8%) had normal nocturnal urine output. (Table I)

Patients with nocturnal polyuria were given advice on fluid restriction before bed-time, as well as avoidance of caffeine and alcoholic drinks. Eleven of these patients who continued to have bothersome nocturia despite simple behavioural modifications were started on oral desmopressin. Eight patients were satisfied with the treatment with 50% reduction of nocturnal voids; 2 patients showed no improvement; 1 patient had stopped the treatment due to headaches. None of the patients on treatment developed hyponatraemia.

Discussion

Nocturia is a common complaint, which often has many causes. Broadly, these reasons include 24-h polyuria, nocturnal polyuria or bladder storage problems and sleep-related issues, as well as behavioural factors. It is also likely to have mixed causes and this should always be considered. Nocturia associated with BPH should resolve after effective treatment of BPH. Patients with persistent nocturia may have mixed causes or due to a cause other than BPH, such as nocturnal polyuria, which was reported to be highly prevalent among elderly individuals[1].

Nocturnal polyuria, or the over-production of urine at night, is an important cause of nocturia[7] that may result from age-related fluctuations in serum levels of the antidiuretic hormone arginine vasopressin (AVP). Advancing age is also associated with increased night-time excretion of water, solutes and electrolytes[8-9]. However, regardless of age, most people with nocturia secrete less AVP nocturnally than do healthy subjects[7,10]. Our study has shown that nocturnal polyuria is the cause of nocturia in a high proportion (85.4%) of patients with treated BPH. Instead of attributing to failure of a1-adrenergic blockers, additional treatment for nocturnal polyuria should be considered in these patients. Oral desmopressin, for example, had been found to be effective in nocturnal polyuria[11-12]. It is a synthetic analogue of AVP and is effective when administered at bed-time, by decreasing night-time urine production[13].

A reasonable approach to the management of nocturia in BPH patients includes identification and treating any underlying conditions which may contribute to nocturia (e.g. diabetes mellitus, primary polydipsia, hypercalcaemia, daytime fluid retention, venous insufficiency, hypoalbuminaemia, diuretic therapy, congestive heart failure, renal disease, neurological dysfunction and sleep apnoea). Advice on behavioural modification, such as caffeine and alcohol intake, bed-time fluid consumption and night-time influences (noise, anxiety, partner's habits) is beneficial. Empirical treatment for nocturnal polyuria without a frequency/ volume chart may be appropriate due to its high prevalence in this group of patients. Furthermore,

Table I: Results obtained from frequency/ volume charts

Results	No. patients (%)
Unsatisfactory frequency/ volume chart	8/ 49 (16.3%)
Satisfactory frequency/volume chart	41/ 49 (83.7%)
Nocturnal polyuria	35/ 41 (85.4%)
Polyuria	4/ 41 (9.8%)
Normal norturnal output	2/ 41 (4.8%)

frequency/ volume charts were found to be unsatisfactory in 16.3% of our patients, which imply that it may be difficult to obtain a satisfactory charting in some patients. Patients who fail empirical treatment can be further evaluated with frequency/ volume charts and other investigations such as IVU, cystoscopy or urodynamics when indicated.

Conclusion

Nocturnal polyuria is the cause of nocturia in the majority of patients who are treated for BPH and still complaining of nocturia. Empirical treatment for nocturnal polyuria without a frequency/ volume chart could be a reasonable approach due to its high prevalence and the difficulty to obtain a satisfactory frequency/ volume chart for some patients.

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