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FACTORS TO OVERESTIMATE NOCTURIA: COMPARATIVE STUDY BETWEEN DATA FROM QUESTIONNAIRE AND FREQUENCY-VOLUME CHARTS

Hypothesis / aims of study

According to the International Continence Society, nocturia is defined as awakening at least once at night to void. Nocturia, which is the most prevalent lower urinary tract symptom (LUTS), is reported by a significant proportion of patients with LUTS to be the most bothersome symptom, because it causes sleep disturbance, daytime fatigue, a lower level of general well-being, and increases the risk of nightly falls.

The International Prostate Symptom Score (IPSS) is widely used to facilitate and standardize the symptomatic assessment of patients with LUTS. In addition to symptom questionnaires, the patient-completed frequency-volume chart (FVC) is also commonly used in clinical trials as a primary tool for measuring subjective signs related to the lower urinary tract. By collecting FVCs completed daily by patients over a specific period of time, clinicians can obtain an accurate history, acquire information about voiding frequency, nocturia, and mean volume of urine passed, and understand the voiding patterns in the patient's home environment while carrying out normal daily activities. Consequently, FVCs make it possible to determine and quantify the cause of nocturia. It has been noted that there are relevant differences in questionnaire-based estimates of nocturia and nocturia values derived from FVCs. Therefore, the present study was conducted to compare nocturia, as estimated by the IPSS and a 3-day FVC, and identify factors that correlate with nocturia.

Study design, materials and methods

A total of 210 patients, referred for the evaluation of LUTS to our hospital between April 2011 and August 2012, was analysed prospectively. At the initial visit, all patients underwent a detailed clinical evaluation comprising a complete history, physical examination, assessment of IPSS, quality of life (QOL), and the Overactive Bladder symptom Score (OABSS), urinalysis, urine culture, uroflowmetry, and postvoid residual urine volume measurement. Patients were asked to complete a 3-day FVC, including the time and volume of each void and their bedtime and waking time. Although nocturnal urine volume was defined as the volume of nightly voids plus the first morning void, the first morning void was considered a normal diurnal voiding episode. A nocturnal polyuria index (NPi), the ratio of nocturnal urine volume per 24 hours volume of urine, higher than 0.33 was defined as nocturnal polyuria. Patients who lacked some of the IPSS, QOL, and OABSS questionnaire results, who recorded the FVC for less than 2 days, or who had prostate or bladder cancer, urolithiasis, or urinary inflammation were excluded from this study.

Question 7 of the IPSS, which is on nocturia, assigns the highest score of 5 to 5 or more nocturia episodes per night. Consequently, when the IPSS nocturia score is compared with FVC-calculated nocturia, the maximum and mean nocturia values that scored higher than 5 were considered 5. Mean calculated nocturia was also categorized by rounding values to the nearest integer to correlate it with IPSS values. IPSS-FVC was defined as IPSS calculated from the FVC.

Patients were categorized into three groups: Group A patients, who underestimated the nocturia number in the IPSS; Group B patients, who estimated the nocturia number in the IPSS and IPSS-FVC equally; and Group C patients, who overestimated the nocturia number in the IPSS. Age, body mass index, IPSS total score, QOL index, OABSS total score, OAB or not, OAB wet or not, nocturnal urine volume (NUV), total voided volume (TVV), and NPi were compared. Significant differences between groups were compared with one-way analysis of variance (ANOVA). Associations between IPSS Q7 and IPSS-FVC Q7 were calculated using Spearman's rank order correlation coefficient. Statistical analysis was performed using IBM SPSS ver. 19.0. Significance was defined as a p-value of <0.05.

Results

In total, 64 patients (37 men, 27 women; mean age 67.9 years, range 26-87 years) were eligible for evaluation. These patients included 13 patients (20.3%) in Group A (mean age, 66.2 years; range, 26-86 years), 24 patients (42.2%) in Group B (mean age, 68.5 years; range, 40-86 years), and 24 patients (37.5%) in Group C (mean age, 68.2 years; range, 36-87 years). Table 1 shows the distributions of nocturia scores (IPSS and IPSS-FVCs).

In all, the mean nocturia scores of IPSS Q7 and IPSS-FVC Q7 were 2.9 ± 1.4 and 2.6 ± 1.6 (p=0.030), respectively. In Groups A, B, and C, the mean nocturia scores of IPSS Q7 and IPSS-FVC Q7 were 2.4 ± 1.3 and 3.5 ± 1.5, 3.2 ± 1.5 and 3.2 ± 1.5, and 2.8 ± 1.4 and 1.3 ± 1.1, respectively. No significant differences in sex, age, BMI, history of hypertension and diabetes, IPSS total score, QOL score, OABSS total score, OAB wet, and TVV were observed among the three groups. However, Group C patients had significantly lower NUV (P 0.006) and NPi (P 0.013) than Group B patients. A significant correlation was found between the score of IPSS Q7 minus IPSS-FVC Q7 and NUV (r = -0.304, p .014), and between the score of IPSS Q7 minus IPSS-FVC Q7 and NPi (r = -0.344, p = 0.005).

Table 1. Distribution of nocturia scores of IPSS Q7 and IPSS-FVCs Q7

		IPSS-FVC					
		0	**1**	**2**	**3**	**4**	**5**
IPSS	**5**	0	1	1	0	1	6
	4	0	1	2	2	7	3
	3	0	1	5	4	2	2
	2	1	3	6	2	0	0

	1	6	3	3	0	0	0
	0	1	1	0	0	0	0

The light grey zone shows the number of overestimates; the number of nocturia episodes in the IPSS is greater than the actual number of nightly voids in the FVCs. The white zone and dark grey zone show the numbers that were equal and underestimated, respectively.

Interpretation of results

Hyeon et al. suggested that overestimation of the number of nocturia episodes in the IPSS was more common than underestimation, especially in patients 60 years old or older. On the other hand, van Haarst et al. suggested that 50% of urological outpatients overestimated IPSS Q7, and there was no difference in agreement between patients younger vs older than 60 years or in men vs women. In the present study, sex, age, BMI, history of hypertension and diabetes, IPSS total score, QOL index, OABSS total score, OAB wet, and TVV were not factors related to IPSS underestimation or overestimation of nocturia. The patients who did not suffer from nocturnal polyuria tended to overestimate the actual number of nightly voids.

This study did have limitations. Urological outpatients with various chief complaints were evaluated, so that the result may not be associated with bothersome nocturia. Further studies are needed to confirm these findings by examining patients with bothersome nocturia.

Concluding message

The present results suggest that the FVC should be included as an integral part of the evaluation for nocturia, and the IPSS questionnaire and FVC may complement each other to obtain more accurate evaluation of nocturia.

References

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