

International Prostate Symptom Scores in young asymptomatic American men

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OBJECTIVE

To establish 'normal' ranges of responses to the International Prostate Symptom Score (IPSS) questionnaire from a sample of young, asymptomatic men, as the IPSS is useful both clinically and in research studies, but there are little or no data on the normal ranges of the IPSS.

SUBJECTS AND METHODS

During a previously conducted study of 284 ambulatory men who considered themselves to have normal urinary function, asymptomatic men completed a 24-h urinary diary and the IPSS questionnaire. Diary variables and the IPSS were analysed using nonparametric Kruskal–Wallis and Spearman's tests.

RESULTS

The IPSS was recorded for 243 men aged < 50 years; 153 (63%) were Caucasian, 67 (28%) African-American, 11 (5%) Hispanic and 11 (5%) Asian. Although all men denied lower urinary tract symptoms during study screening, the total IPSS increased with age. Of men aged 18–29 years, 2% reported 'moderate' symptoms (IPSS >7) compared to 12% of men aged 40–49 years ($P = 0.002$). No subject reported 'severe' symptoms (IPSS >19). When responses to individual IPSS questions were analysed, all item scores except frequency (question 2) and hesitancy (question 6) increased with age. Nocturia (question 7) was often reported, and 11% of men aged 18–29 and 31% of men aged 40–49 years reported two or more nightly voids.

CONCLUSIONS

In this study, the consistently increasing positive IPSS with ageing in almost all symptom categories suggests underlying changes in urinary habits even in this asymptomatic group. Studies of normal urinary habits remain critically important to understanding normal and abnormal function, both for the design of research studies and for counselling patients.

KEYWORDS

IPSS, lower urinary tract symptoms, nocturia, urinary frequency, men

INTRODUCTION

The measurement committee of the AUA developed the AUA symptom index (AUA-7) as a tool for evaluating and following urinary symptoms in men with BPH [1]. The AUA-7, together with an additional item on quality of life (QoL), was then termed the IPSS, recommended by the WHO as the instrument of choice for quantifying BPH-related urinary symptoms in clinical trials. The IPSS has been translated into several languages and has become a commonly used instrument in multicentre, international clinical trials. Much information has been gathered on the prevalence on urinary symptoms in older, symptomatic or unselected populations, but little is known about urinary symptoms in asymptomatic younger men. Only one study has examined urinary symptoms in an unselected population of men aged 20–49 years [2].

We studied 284 asymptomatic men who completed a 24-h voiding diary and the IPSS

questionnaire; the diary-variable results have been reported elsewhere [3]. As might be expected, we found that 24-h voiding frequency was directly related to total urine volume and total fluid intake. The IPSS increased with patient age and with urinary frequency as reported in a 24-h diary. The IPSS was lower in white men and inversely related to fluid intake. As there is little published information on the IPSS in young, asymptomatic men, we analysed these scores in more detail. The purpose of this report is to describe the IPSS in men aged < 50 years.

SUBJECTS AND METHODS

The methods used to assess the urinary habits of asymptomatic men were reported previously [3]. Briefly, men who considered their urinary function to be normal were invited to complete the IPSS questionnaire, and those who were free of LUTS, a history of urolithiasis, prostate problems, neurological disorders, pelvic pain or penile discharge,

recent sexually transmitted disease or UTI were invited to join the study. Subjects were recruited at Loyola University Medical Center, Maywood, IL, and the University of Iowa Medical Center, Iowa City, IA, USA. Subjects completed a 24-h diary of fluid intake and voided volumes, indicating the time of retiring to sleep and the time of arising in the morning, and were asked to maintain their usual urinary habits during the 24-h diary period. Data from men < 50 years old who had interpretable diaries and IPSS questionnaire responses were included in this analysis. Both institutional review boards approved the study. Data were analysed using nonparametric Kruskal–Wallis and Spearman's tests.

RESULTS

Of the 284 men returning interpretable diaries and IPSS questionnaires, 243 were aged < 50 years; of these, 153 (63%) were Caucasian, 67 (28%) African-American, 11

Variable	Age, years			P
	18–29	30–39	40–49	
N	149	37	57	
Overall characteristics				
BMI, kg/m ²	24 (23–27)	25 (23–29)	27 (24–31)	<0.001*
IPSS	2 (0–3)	2 (1–3.8)	3 (1–7)	0.002*
QoL score	1 (1–2)	2 (1–2)	2 (1–2)	NS
Total IPSS, % men				
0–7	98	97	88	
8–19	2	3	12	
>19	0	0	0	
IPSS questions % men with scores ≥ 2				
1. Incomplete emptying	3	0	9	<0.05†
2. Frequency	20	14	37	NS
3. Intermittency	2	6	17	<0.01†
4. Urgency	1	3	17	<0.05†
5. Weak Stream	1	0	4	<0.01†
6. Hesitancy	1	0	6	NS
7. Nocturia	11	19	31	<0.01†
Diary reports of nocturia, % men				
none	85	67	47	
1	14	31	44	
2	1	3	5	
3	0	0	4	
Nocturia ≥1	15	34	53	<0.001†

TABLE 1
Demographics, IPSS data and 24-h diary variable values according to age. Variables were not normally distributed; values for overall characteristics are median (25th–75th quartile).

*Kruskal–Wallis tests for differences between values, with subjects grouped by age decade; †Chi-squared test of proportions. NS, not significant.

(5%) Hispanic and 11 (5%) Asian. Table 1 details the body mass index (BMI) and the IPSS with age group. BMI, diary reports of nocturia once or more and the IPSS increased with increasing age; QoL scores did not vary significantly with age.

To facilitate comparison of the present results with those of the only other published study of the IPSS in young men, the results according to age (decade) of the subject are also shown; the total IPSS increased with age (Table 1). The overwhelming majority of men reported 'mild' symptoms (IPSS ≤ 7). Of men aged 40–49 years, 12% reported 'moderate' symptoms, compared to 2% of men aged 18–29 years. No one reported an IPSS that indicated 'severe' symptoms (IPSS > 19), as would be expected in a study of asymptomatic men.

Using a similar approach to that of Moon *et al.* [2], we identified the frequency of positive responses (scores ≥ 2) for each question in the IPSS (Table 1). The numbers shown represent the percentage of men in each age group who responded with a score of ≥ 2 for each question. Except for frequency

(IPSS question 2) and hesitancy (question 6), all individual IPSS item scores were significantly correlated with age.

The responses to IPSS question 7 showed that nocturia frequency increased with age (Table 1, Spearman's $r = 0.24$, $P < 0.001$). The question is 'Over the past month, how many times did you most typically get up to urinate from the time you went to bed at night until the time you got up in the morning'. Nocturia episodes of once or more were reported by 45% of men aged 18–29 years, 58% aged 30–39 years and 73% aged 40–49 years.

The number of nocturia episodes recorded in the 24-h voiding diaries also increased with age (Table 1); generally there were fewer than reported using IPSS question 7, although nocturia frequency as described by these two variables was highly correlated (Spearman's $r = 0.3$, $P < 0.001$).

DISCUSSION

To our knowledge, this is the first study to describe the IPSS in young asymptomatic

men, other studies having reported the IPSS in unselected subjects. Moon *et al.* [2] surveyed 184 men aged 20–49 years from a National Guard unit, reporting that 5% of men aged 20–29 years, 12% aged 30–39 and 14% aged 40–49 had an IPSS of ≥ 8. Their evaluation of individual IPSS question responses showed no progression with age, but they reported that 25% of men < 49 years old had responses of two or more for frequency (IPSS question 2). The authors also reported that 14% of men aged 20–29 years and 26% aged 40–49 years had responses of two or more for nocturia (IPSS question 7). Not surprisingly, the asymptomatic men in the present study reported a lower IPSS than those in the study of Moon *et al.* [2], where there was a 5% incidence of prostatitis. By contrast, in the present study there was a significant progression of symptom scores with age for frequency (question 2) and nocturia (question 7). The reason for this discrepancy between the studies is unknown.

Nocturia, as measured by a score of two or more on IPSS question 7, significantly increased with age even for these asymptomatic men, from 11% of those aged 18–29 to 30% of men aged 40–49 years. Although Moon *et al.* [2] found a similar increase, of 14% in men aged 20–29 years to 26% when aged 40–49 years, this was not statistically significant. In the present study the frequency of nocturia, as reported in the 24-h diaries, was also assessed, and was notably less than that reported using IPSS question 7 (nocturia). This was probably because a single 24-h voiding diary might not accurately predict the 'typical night during the last month', as is requested in the IPSS question.

In the present study the consistently increasing frequency of a positive IPSS with ageing in almost all symptom categories suggests underlying real changes in urinary habits, even in this asymptomatic group. Knowledge of the range of IPSS might be useful in the design of clinical trials for treating BPH, perhaps to be used as an ideal study endpoint. Clearly, an IPSS of zero is not required for 'normality'.

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CONFLICT OF INTEREST

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Abbreviations: **QoL**, quality of life; **BMI**, body-mass index.