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The prevalence of chronic prostatitis-like symptoms in young men: a community-based survey

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Abstract We surveyed the prevalence of chronic prostatitis-like symptoms in young men using the National Institutes of Health (NIH) Chronic Prostatitis Symptom Index (CPSI) and determined the clinical validity of the NIH-CPSI among men in the community. Of 29,017 men aged 20 years dwelling in the community, 8,705 men were randomly selected at a 30.0% sampling fraction and a total of 6,940 men (a response rate 79.7%) completed a self-administered questionnaire. Six percent reported having pain or discomfort in more than one area. About 5% did not feel that the bladder emptied fully after urinating more than 1 time in 5 and 10.5% had to urinate again within 2 h more than 1 time in 5. As the scores for pain or discomfort increased, those for urinary symptoms and impact on quality of life increased ($P < 0.001$; Armitage test). As the scores for urinary symptoms increased, those for pain or discomfort and impact on quality of life also increased ($P < 0.001$; Armitage test). The community-based prevalence of chronic prostatitis-like symptoms were found to be high in young men as well as in older men. Our findings indicate that men with pain or urinary symptoms experience a negative impact on their quality of life and the NIH-CPSI provides a valid measure for the general population.

Key words Prostate · Prostatitis · Pain · Pelvis · Epidemiology · Quality of life

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Introduction

Chronic prostatitis is a common disease and an important urological problem in adult men of all ages. However, few prospective studies have surveyed a population of young men for lower urinary tract symptomatology or pain associated with prostatitis. Recently, the Chronic Prostatitis Collaborative Research Network funded by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) [5] developed and validated the National Institute of Health (NIH) Chronic Prostatitis Symptom Index (CPSI) to measure the symptoms of chronic prostatitis and their impact on the daily lives of patients (see Appendix). This index was easily stratified into the logical domains of pain, urinary symptoms, and impact on quality of life and had excellent internal consistency and high test-retest reliability. However, further data are needed to determine whether this index performs as well in general and other diverse populations so that the index can be generalized to the general population.

Our goal was to evaluate the symptomatology associated with chronic prostatitis, to gather epidemiologic data on this disease in young men, and to determine the clinical validity of the NIH-CPSI among men in the community.

Material and methods

Subjects

South Korea has adopted the conscription system and all men are examined for the conscription at the Military Manpower Administration when they are 20 years old. This cross-sectional survey was conducted at the Military Manpower Administration in Taejeon and a sampling process was used by census district. Of 29,017 men aged 20 years dwelling in the community of Choong-chung South Province including Taejeon, 8,705 were randomly selected at a 30.0% sampling fraction.

Measures

After an introduction to the project stating that this questionnaire was not given as part of an overall military fitness examination and the subjects' responses were kept unsigned, men who agreed to participate in the study gave their informed consent prior to their inclusion in the study. All volunteers were evaluated, including a detailed medical history, physical examination, and urinalysis, and completed a self-administered questionnaire in written form. They were excluded from the study if they had any of the other specified exclusion criteria such as a urethral stricture, pyuria, and neurogenic bladder. A response was considered invalid if the question was left unanswered or if more than one answer was marked on the self-administered questionnaire. A total of 6,940 men (a response rate of 79.7%) were included in this study.

Data analysis

The nine items included locations of pain or discomfort, additional types of pain, frequency of pain or discomfort, severity of pain or discomfort, incomplete emptying, frequency of urination, limitations of activities, psychological distress, and overall quality of life. The symptom index of 0 to 43 was calculated by summing the scores of four pain/discomfort items, 2 urinary symptoms, and 3 impact on quality of life items. Survey responses were coded and descriptive analyses were performed on questionnaires from 6,940 participants. In order to analyze whether the domains of this index correlated well with each other, we stratified each domain into four groups based on the sum of the scores. In the pain or discomfort category, a score of 0 was classified as group 1, a score of 3–6 as group 2, a score of 7–10 as group 3, and a score of 11–21 as group 4. Urinary symptoms were classified as group 1 if the score was 0, group 2 if the score was 1–3, group 3 if the score was 4–6, and group 4 for a score of 7–10. Quality of life divided subjects into group 1 if they had a score of 0, group 2 for scores 1–4, group 3 for scores 5–8, and group 4 for scores 9–12. The score test indicating a trend between each domain was performed using the Armitage test and a 5% level of significance was used for all statistical testing. Statistical analyses were performed using a commercially available analysis program.

Results

Prevalence and severity of symptoms

The distribution of each item in the NIH-CPSI among 6,940 participants is shown in Table 1. While most

men reported they never experienced pain or discomfort (items 1 and 2), 6.0% reported having pain or discomfort in more than one area. Of the total number of participants, 4.3% did not feel that the bladder emptied fully after urinating (item 5), with a score higher than 1 and 10.5% had to urinate again within 2 h (item 6), again with a score higher than 1. The extent to which they experienced interference in daily activities and psychological distress (items 7 and 8) was strongly skewed to a score of 0 (not at all). On the quality of life question concerning how subjects would feel if they were to spend the rest of their lives with their symptoms as they had reported for the past week (item 9), 5.8% reported mostly dissatisfied, unhappy, or terrible.

Classification of symptoms

Each domain was classified into four groups based on the sum of scores. For pain or discomfort (items 1–4), most men were classified as group 1, 3.1% as group 2, 2.4% as group 3, and 0.5% as group 4. For urinary symptoms (items 5 and 6), 59.2% were in group 1, 35.4% in group 2, 4.4% in group 3, and 1.0% in group 4. For impact on quality of life (items 7–9), 59.7% was classified as group 1, 35.0% as group 2, 4.7% as group 3, and 0.6% as group 4 (Table 2).

Impact of symptoms

Of men with no pain or discomfort, 90.3% were included in groups 1 or 2 for urinary symptoms and 92.7% were included in groups 1 or 2 for impact on quality of life. As the pain or discomfort scores increased, those for urinary symptoms and impact on quality of life increased ($P < 0.001$, Armitage test, Table 3). Of men with no urinary symptoms, 58.1% were in groups 1 or 2 for pain or discomfort and 92.7% were in groups 1 or 2 for the impact on quality of life.

Table 1 The distribution of each item in the NIH Chronic Prostatitis Symptom Index^a

Score	Pain locations	Pain frequency	Pain severity	Incomplete emptying	Frequency of urination	Impact	Overall quality of life
Items	1, 2	3	4	5	6	7, 8	9
0	6,520 (94.0)	6,518 (93.9)	6,520 (94.0)	5,847 (84.2)	4,335 (62.5)	6,425 (92.6)	4,179 (60.2)
1	298 (4.3)	186 (2.7)	48 (0.7)	763 (11.0)	1,873 (27.0)	222 (3.2)	961 (13.8)
2	83 (1.2)	150 (2.2)	94 (1.4)	172 (2.5)	373 (5.4)	171 (2.5)	1,163 (16.8)
3	27 (0.4)	55 (0.8)	102 (1.5)	82 (1.2)	204 (2.9)	54 (0.8)	236 (3.4)
4	9 (0.1)	23 (0.3)	59 (0.9)	32 (0.5)	81 (1.2)	50 (0.7)	230 (3.3)
5	2 (0.0)	8 (0.1)	60 (0.9)	44 (0.6)	74 (1.0)	12 (0.2)	108 (1.6)
6	1 (0.0)		24 (0.3)			6 (0.0)	63 (0.9)
7			17 (0.2)				
8			11 (0.1)				
9			2 (0.0)				
10			3 (0.0)				
Total	6,940 (100)	6,940 (100)	6,940 (100)	6,940 (100)	6,940 (100)	6,940 (100)	6,940 (100)

^a Values are numbers (%) of the participants

Table 2 The stratification of each domain in the NIH Chronic Prostatitis Symptom Index^a

Stratifications ^b	Domain		
	Pain or discomfort	Urinary symptoms	Impact on quality of life
Items	1–4	5, 6	7–9
Group 1	6,520 (94.0)	4,108 (59.2)	4,141 (59.7)
Group 2	218 (3.1)	2,457 (35.4)	2,431 (35.0)
Group 3	165 (2.4)	302 (4.4)	323 (4.7)
Group 4	37 (0.5)	73 (1.0)	45 (0.6)
Total	6,940 (100)	6,940 (100)	6,940 (100)

^a Values are numbers (%) of the participants^b Stratifications of each domain by summing the scores; pain – group 1 (0), group 2 (3–6), group 3 (7–10) and group 4 (11–21); urinary symptoms – group 1 (0), group 2 (1–3), group 3 (4–6) and group 4 (7–10); impact on quality of life – group 1 (0), group 2 (1–4), group 3 (5–8) and group 4 (9–12)**Table 3** Comparisons of each domain based on the pain domain^a

Pain	Urinary symptoms*				Impact on quality of life *			
	Group 1	Group 2	Group 3	Group 4	Group 1	Group 2	Group 3	Group 4
Group 1	4,003 (58.1)	2,237 (32.2)	216 (3.1)	39 (0.6)	4,137 (59.6)	2,296 (33.1)	80 (1.2)	9 (0.1)
Group 2	39 (0.6)	132 (1.9)	34 (0.5)	13 (0.2)	4 (0.0)	109 (1.6)	98 (1.4)	7 (0.1)
Group 3	32 (0.5)	80 (1.1)	36 (0.5)	17 (0.3)	0 (0.0)	25 (0.4)	123 (1.8)	17 (0.2)
Group 4	4 (0.0)	8 (0.1)	16 (0.2)	9 (0.1)	0 (0.0)	1 (0.0)	22 (0.3)	14 (0.2)

* $P < 0.001$, Armitage test^a Values are numbers (%) of the participants

Of men included in group 1 for urinary symptoms, 32.2% were included in group 1 for pain or discomfort. As the scores for urinary symptoms increased, those for pain or discomfort and impact on quality of life also increased ($P < 0.001$, Armitage test, Table 4). The degree to which symptoms bothered men increased significantly as the severity of pain or discomfort and urinary symptoms increased.

Discussion

Patients with chronic prostatitis present with pain and variable urinary symptoms [1, 4]. Urinary symptoms cannot discriminate chronic prostatitis and benign prostatic hyperplasia (BPH), do not predict the sickness impact profile, and are irrelevant for some patients with chronic prostatitis [2, 9]. But urinary symptoms were the second most frequently declared symptoms on visits

where there was a primary diagnosis of chronic prostatitis and were an integral part of chronic prostatitis for others [2, 5]. Thus, the Chronic Prostatitis Collaborative Research Network considered it important to include urinary symptoms in the NIH-CPSI [5]. Moon et al. [6] found that 2% of men aged 20–30 years had a score higher than 1 for incomplete emptying and 24% had a score higher than 1 for urinary frequency less than 2 h. However, a score higher than 1 for a daily occurrence of urinary frequency less than 2 h in 24% is much more frequent and a score higher than 1 for incomplete emptying less than 2 h in 2% is much less frequent than might be anticipated based on clinical experience. Our data revealed that 4.3% did not feel that the bladder emptied fully after urinating with a score higher than 1 and 10.5% had to urinate again within 2 h with a score higher than 1. We think that this discrepancy may result from the difference in age, race, or the method of the study.

Table 4 The comparisons of each domain based on urinary symptoms domain^a

Urinary symptoms	Pain*				Impact on quality of life*			
	Group 1	Group 2	Group 3	Group 4	Group 1	Group 2	Group 3	Group 4
Group 1	4,033 (58.1)	39 (0.6)	32 (0.5)	4 (0.0)	3,065 (59.6)	1,003 (33.1)	36 (1.2)	4 (0.1)
Group 2	2,237 (32.2)	132 (1.9)	80 (1.1)	8 (0.1)	1,057 (0.0)	1,245 (1.6)	145 (1.4)	10 (0.1)
Group 3	216 (3.1)	34 (0.5)	36 (0.5)	16 (0.2)	19 (0.0)	167 (0.4)	101 (1.8)	15 (0.2)
Group 4	34 (0.6)	13 (0.2)	17 (0.3)	9 (0.1)	0 (0.0)	16 (0.0)	41 (0.3)	16 (0.2)

* $P < 0.001$, Armitage test^a Values are numbers (%) of the participants

Pain is the most prominent urogenital symptom of chronic prostatitis. Patients with prostatitis reported more pain than patients with BPH or sexual dysfunction and pain symptoms predominated among men making visits for chronic prostatitis [1, 2, 4]. Moreover, the single most common reason for chronic prostatitis visits was painful urination [2]. In our experience, 6.0% reported having pain or discomfort in the area more than once, while most men reported they never experienced pain or discomfort. However, a 20-year-old study suggested that 20 of every 1000 health care visits were for prostatitis [3]. This finding suggests that it is possible that mail or Internet surveys or the Ambulatory Medical Care Surveys may not reflect the general population of men with chronic prostatitis-like symptoms and underestimate the prevalence of this disease due to episodes of chronic prostatitis that might not have come to medical attention. The population seeking care for chronic prostatitis is not the same as the population with pain or discomfort and urinary symptoms.

To discuss aspects of chronic prostatitis most effectively, for example, epidemiology, an operational definition is essential; however, the definition is unclear, the etiology is obscure, the relevance of the only objective finding we have (leukocytes) is unknown, symptoms are highly variable, and the natural history of the disease has not been adequately studied. Culture and white blood cell status, although important from a research viewpoint, may not be a significant feature in clinical practice except for choosing appropriate therapy. Because the hallmark of chronic prostatitis is the symptom complex, a consistent, standardized, and validated approach for quantitating symptoms is mandatory. Although several symptom questionnaires of chronic prostatitis have been validated and are extremely useful [4, 7, 8], these ques-

tionnaires are not perfect. The NIH-CPSI addressed the three most important domains of chronic prostatitis: pain (location, severity, and frequency), voiding (irritative and obstructive symptoms), and impact on quality of life. This new index had excellent internal consistency and high test-retest reliability. Because the NIH-CPSI is a reliable and valid means of recording the symptoms and impact of the clinical entity, this index will serve as a primary criterion on which subsequent successes are judged in clinical trials. However, further data are needed to determine whether this index performs as well in general and other diverse populations so that the index can be generalized to the general population.

Because the distribution of the scores on the NIH-CPSI is strongly skewed to 0, we stratified each domain, based on the sum of scores, into four groups and analyzed whether the three domains of this index correlated well with each other. As the scores for pain or discomfort increased, those for urinary symptoms increased. As the scores for pain or discomfort and urinary symptoms increased, those for impact on quality of life impact increased. The degree to which symptoms bothered men increased significantly as the severity of pain or discomfort and urinary symptoms increased. Patients with chronic prostatitis experienced a negative impact on their quality of life, similar to patients with unstable angina, a recent myocardial infarct, or active Crohn's disease [9]. Our findings suggest that this new index has good construct validity for the general population, as urinary symptoms as well as pain or discomfort contributed significantly to explaining variance in the quality of life.

In conclusion, the community-based prevalence of chronic prostatitis-like symptoms may be high in young men and the NIH-CPSI provides a valid measure for the general population.

Appendix

NIH Chronic Prostatitis Symptom Index (NIH-CPSI)

Pain or Discomfort

1. In the last week, have you experienced any pain or discomfort in the following areas? ☐ Yes ☐ No
 - a. Area between rectum and testicles (perineum)
 - b. Testicles
 - c. Tip of the penis (not related to urination)
 - d. Below your waist, in your pubic or bladder area
2. In the last week, have you experienced:
 - a. Pain or burning during urination?
 - b. Pain or discomfort during or after sexual climax (ejaculation)?
3. How often have you had pain or discomfort in any of these areas over the last week?

<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Never	Rarely	Sometimes	Often	Usually	Always
4. Which number best describes your AVERAGE pain or discomfort on the days that you had it, over the last week?

<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input type="checkbox"/> 9	<input type="checkbox"/> 10
									(no pain)
									(pain as bad as you can imagine)

Appendix (Continued)**NIH Chronic Prostatitis Symptom Index (NIH-CPSI)****Urination**

5. How often have you had a sensation of not emptying your bladder completely after you finished urinating, over the last week?
- | | | | | | |
|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| Not at all | Less than 1 time in 5 | Less than half the time | About half the time | More than half the time | Almost always |
6. How often have you had to urinate again less than two hours after you finished urinating, over the last week?

Impact of symptoms

7. How much have your symptoms kept you from doing the kinds of things you would usually do, over the last week?
- | | | | |
|----------------------------|----------------------------|----------------------------|----------------------------|
| <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 |
| None | Only a little | Some | A lot |
8. How much did you think about your symptoms, over the last week?

Quality of life

9. If you were to spend the rest of your life with your symptoms just the way they have been during the last week, how would you feel about that?
- | | | | | | | |
|----------------------------|----------------------------|----------------------------|--|----------------------------|----------------------------|----------------------------|
| <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 | <input type="checkbox"/> 6 |
| De-lighted | Pleased | Mostly satisfied | Mixed (about equally satisfied and dissatisfied) | Mostly dissatisfied | Unhappy | Terrible |

Scoring the NIH-Chronic Prostatitis Symptom Index Domains

Pain: Total of items 1a, 1b, 1c, 1d, 2a, 2b, 3, and 4 = _____

Urinary Symptoms: Total of items 5 and 6 = _____

Impact on quality of Life: Total of items 7, 8 and 9 = _____

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