Original Article

Prevalence of lower urinary tract symptoms in a community-based survey of men in Turkey

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Abstract
Aim: The aim of the present study was to determine the frequency of lower urinary tract symptoms (LUTS), assess the impact of LUTS on quality of life (QOL) and compare the results with recent reports from other population-based studies.
Methods: A total of 266 men participated in the study. The men were stratified into 10-year age groups between 40 and 79 years. All participants were asked to complete a questionnaire that included a Turkish translation of the International Prostate Symptom Score (IPSS) with QOL questions, and void into a uroflowmeter to obtain voided urine volume, peak and mean flow rate.
Results: While 14.8% of men had no symptoms (IPSS=0), 24.9% had moderate to severe symptoms (IPSS>7). Severity of symptoms increased with age (*P*=0.0018). There was a strong relationship between bother score and IPSS (rs=0.79, *P*=0.0001). Fifty-five percent of moderately symptomatic and 78% of severely symptomatic men reported poor QOL (QOL score ≥3). The results of the survey provide a general picture of the symptomatology and urinary flow profiles of elderly men living in Turkey.
Conclusion: The prevalence of LUTS in the Turkish community is fairly high, it increases with age and has an impact on QOL that is not negligible.

Key words
community, lower urinary tract symptoms, Turkey.

Introduction

Benign prostatic hyperplasia (BPH) is the most common urologic disease in elderly males. Despite its enormous impact on public health and the economy, the prevalence of BPH in Turkey based on hard epidemiological data is not known. Although the age specific autopsy prevalence of BPH shows few geographic variations, clinically diagnosed BPH varies widely among countries.[1] The differences result from the lack of standard definition of clinically diagnosed BPH, diagnostic methods, study design and insufficient descriptive epidemiological data.[2] IPSS is a recommended method to estimate the prevalence and severity of lower urinary tract symptoms (LUTS).[3]

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We conducted a community-based study of prevalence of urinary symptoms in Turkish men older than 40 years. The aim of this study was to estimate the frequency of LUTS, assess the impact of the disease on quality of life (QOL) and compare the results with recent reports from other population-based studies from different countries.

Methods

The study was conducted in two different groups: one group consisted of a cross-sectional sample living in a rural area of Ankara; the second group was a convenience sample of men who were members of the Ankara Emeritus Forester Association (AEFA). All of the AEFA members of lived in urban central Ankara. The other members lived in the small village of Sarayköy, which is 25km away from Ankara. Three hundred and eighty men over the age of 40 were registered to the primary

Table 1 Age distribution and responses of men who participated in a Turkish study to determine the frequency of lower urinary tract symptoms (LUTS) and assess their impact on quality of life (QOL)

Age group (years)	Population		Response	
	n	(%)	n	(%)
40–49	184	42.0	79	29.7
50–59	97	22.1	62	23.3
60–69	95	21.7	74	27.8
70–79	60	13.7	49	18.4
80–89	2	0.5	2	0.8
Total	438	100	266	100

care center of Sarayköy. Two hundred and eight of these subjects (54.7%) participated the study, which had been advertised by mail and public announcements. All members of the AEFA participated in the study. Two hundred and sixty-six men participated in the study and were stratified into 10-year age groups between 40 and 79 years of age (Table 1). Verbal consent was obtained from the subjects and all participants were asked to complete the questionnaire and void into a uroflowmeter to obtain voided urine volume, peak and mean urine flow rate. The questionnaire consisted of three parts (see Appendix): Part I included six sociodemographic questions about the participants (age, education, marital status, employment status and medical history); Part II included 12 questions about prostatic disease to evaluate the medical knowledge and common beliefs of the participants; and Part III consisted of a Turkish translation of the International Prostate Symptom Score (IPSS), which comprised seven LUTS questions (incomplete emptying, frequency, intermittency, urgency, poor flow, hesitancy and nocturia) and one QOL question. Each symptom was scored as a value of 0–5 (0, not at all; 1, less than one time in five; 2, less than half the time; 3, about half the time; 4, more than half the time; and 5, almost always during the proceeding month). A symptom score of 0–35 was calculated by adding the scores the patient gave to each of the seven symptoms. An irritative symptom score was obtained by adding the frequency, urgency and nocturia values, while an obstructive score was calculated by adding the scores of incomplete emptying, intermittency, weak stream and straining symptoms. Next, the symptom score were categorized into four levels of severity from 'none' to 'severe' (0, none; 1–7, mild; 8–19, moderate; and 20–35, severe).[4] The QOL question was utilized to score the overall discomfort to patients caused by their current urinary symptoms, from 0 to 6 (0, delighted; 1, pleased; 2, mostly satisfied; 3, mixed [about equality satisfied

and dissatisfied]; 4, mostly dissatisfied; 5, unhappy; and 6, terrible). Individuals were excluded from the study if they had undergone previous prostatic surgery, taken any medication that affected voiding function, a history of prostate or bladder cancer, urethral strictures, active bladder stone disease, neurogenic bladder function or uncontrolled diabetes mellitus.

Uroflowmetry was performed using Dantec UD 5000 (Dantec, Copenhagen, Denmark). Voided urine volume, peak flow rate and mean flow rate were recorded. The uroflowmetry was conducted for 191 individuals (72%).

Statistical analysis were performed using the χ^2 test to compare group proportions. Mann–Whitney U- and Kruskal–Wallis one-way ANOVA tests were used for non-parametric variance analysis. The relationship between different parameters was calculated by Spearman rank order correlation test. $P < 0.05$ was defined as statistically significant (two-tailed). Multiple independent variables that can potentially affect dependent variables were evaluated by logistic regression.

Results

In the village of Sarayköy, of 380 men who were 40 years of age or older, 172 were not accessible for the study. The overall response rate was 54.7%. The age distribution of those who responded differed from the male population of Sarayköy. The men aged between 40 and 49 years seemed to be under-represented, and the other age groups were slightly over-represented (Table 1). Of the AEFA members, 58 were admitted to participate in the study. A total of nine men were excluded from study. Of those, two were uncooperative, while the others had uncontrolled diabetes and were receiving medical BPH treatment. Data of the 257 men were analyzed.

The demographics of our samples showed some differences. The most important difference was the educational status. Of the Sarayköy population, 69.1% had received only primary school education or had no formal education, while 86.8% of the AEFA members were high school or faculty graduates. Of the subjects, only five men (1.9%) could truly define what the prostate was, while 60.3% had no knowledge of the prostate gland. Furthermore, 70.4% of the individuals had no knowledge of the treatment options for LUTS. When asked if they were to be faced with a decision to be treated either with surgery or with drugs, 87.9% of the participants preferred medical treatment, even though they were told that medical treatment is only symptomatic. Only 39 men (16.2%) had consulted a physician for LUTS.

Table 2 Prevalence of International Prostate Symptom Score (IPSS) severity by age† of men who participated in a Turkish study to determine the frequency of lower urinary tract symptoms (LUTS) and assess their impact on their quality of life (QOL)

Age group (years)	Mild		Moderate		Severe	
	n	(%)	n	(%)	n	(%)
40–49	71	89.9	8	10.1	0	0
50–59	49	79.0	11	17.7	2	3.2
60–69	46	64.8	20	28.2	5	7.0
70+	27	60.0	16	35.6	2	4.4
Total	193	75.1	55	21.4	9	3.5

†The frequency of moderate and severe symptom group increased with age ($P=0.0018$).

Table 3 International Prostate Symptom Score (IPSS) and age† distribution of men who were bothered or not by lower urinary tract symptoms (LUTS)

IPSS score	QOL<3		QOL≥3	
	n	(%)	n	(%)
Mild	181	93.8	12	6.2
Moderate	25	45.5	30	54.5
Severe	2	22.2	7	77.8
Age group				
40–49	69	87.3	10	12.7
50–59	55	88.7	7	11.3
60–69	50	70.4	21	29.6
70+	34	75.6	11	24.4
Total	208	80.9	49	19.1

†Total IPSS affected quality of life (QOL) significantly ($rs=0.42$, $P=0.00001$).

The most prevalent symptom was nocturia (66.1%), followed by urination frequency (44.4%), incomplete emptying of the bladder (40.1%), poor urine flow (40.1%), intermittency of urination (35.0%), urgency of urination (26.8%) and hesitancy of urination (17.5%). The severity of nocturia, frequency, intermittency and poor flow significantly increased with age ($P<0.05$).

A total of 38 individuals (14.8%) had no urinary symptoms (IPSS, 0). It decreased to 12.4% for individuals older than 50 years of age. When the symptoms were categorized according to severity, 75.1% had mild symptoms; 21.4% had moderate symptoms; and 3.5% had severe symptoms (Table 2). The frequency of the moderate and severe symptom groups increased with age ($P=0.0018$, Table 2). Educational status and profession did not affect IPSS when adjusted for age.

The bother score was found to be closely related to the total IPSS score, and there was a statistically significant correlation ($rs=0.79$, $P=0.0001$). Overall, 19.1% of subjects had a QOL score of ≥3. Of men with mild symptoms, only six percent believed that the symptoms affected their QOL (QOL≥3, Table 3). In moderate symptomatic groups this proportion was 55%, while in severe symptomatic groups, it was 78% (Table 3). Overall, only 16.2% of the men reported that they sought medical care for urinary symptoms.

When the symptoms were evaluated separately, frequency ($rs=0.59$) and nocturia ($rs=0.53$) were the symptoms that affected QOL the most and hesitancy ($rs=0.25$) the least. Irritative and obstructive symptom scores also correlated with the QOL score ($rs=0.70$ and 0.64, respectively).

When the subjects were classified as not bothered (QOL<3) and bothered (QOL≥3), educational status was not found to have a significant affect on univariate analysis. However, total IPSS score, age and profession adversely affected the QOL score. Logistic regression

Table 4 Mean and median peak flow rates by age group of men who participated in a Turkish study to determine the frequency of lower urinary tract symptoms (LUTS) and assess their impact on quality of life (QOL)

Age group	Age interval	Mean $Q_{max}\pm SD$	Median Q_{max}	Statistics
1	40–49	22.020±7.793	19.6	1–2, $P=0.0151$
2	50–59	18.002±6.769	17.3	1–3, $P=0.0003$
3	60–69	16.741±74.11	15.6	1–4, $P=0.00001$
4	70+	12.141±5.251	10.7	2–4, $P=0.00001$
Total	40+	17.627±7.773	16.0	3–4, $P=0.0005$

analysis showed that total IPSS was the only parameter that affected QOL significantly ($rs=0.42$, $P=0.00001$).

Age inversely correlated with uroflowmetric parameters ($rs = -0,48$ for peak flow rate, -0.52 for average flow rate, and $-0,25$ for voided volume, $P<0.001$ for all). Mean peak flow rate decreased by age and this drop was found to be statistically significant ($P=0.00001$). Median peak urinary flow rate decreased from 22 mL/s in men 40–49 years to 12.1 mL/s for men older than 70 years (Table 4).

Discussion

The results of this survey provide a general community-based picture of symptomatology and urinary flow profiles of men living in Turkey. This is the first report to investigate the prevalence of LUTS in Turkey. Of our study population, 14.8% who were older than 40 (12.4% were older than 50) were asymptomatic. The frequency of asymptomatic men in this type of survey varies between 9 and 18.8% in different studies.[5–9] In our study,

Table 5 International Prostate Symptom Score (IPSS) of a Turkish study to determine the frequency of lower urinary tract symptoms (LUTS) of participants and assess their impact on quality of life (QOL) compared with IPSS of other similar studies

Age group (years)	Region	Mild (%)	Moderate (%)	Severe (%)
40–49	Ankara	90	10	0
	Shimamaki-mura[10]	53	45	2
	Olmsted County[11]	74	25	1
	Singapore[12]	94	6	0
	Spain[13]	89	9	2
	Asia and Australia[14]	82	16	2
	Korea[15]	–	–	–
50–59	Ankara	79	18	3
	Shimamaki-mura[10]	56	36	8
	Olmsted County[11]	68	30	2
	Singapore[12]	91	8	0
	Spain[13]	79	17	4
	Asia and Australia[14]	71	25	4
	Korea[15]	82	15	3
60–69	Ankara	65	28	7
	Shimamaki-mura[10]	48	45	7
	Olmsted County[11]	60	37	3
	Singapore[12]	82	17	1
	Spain[13]	71	25	4
	Asia and Australia[14]	60	33	7
	Korea[15]	77	19	4
70+	Ankara	60	36	4
	Shimamaki-mura[10]	37	57	6
	Olmsted County[11]	55	42	3
	Singapore[12]	72	21	6
	Spain[13]	55	37	8
	Asia and Australia[14]	44	26	12
	Korea[15]	65	44	9

moderate to severe LUTS were present in 24.9% of the participants. When three categories of symptoms were analyzed, relatively similar results were found across all studies (Table 5). However, community studies from Japan seemed to show higher symptom scores in the corresponding ages, while an epidemiological study from Singapore reported significantly lower frequency of symptoms and lower bother score from the symptoms.[10–12] The results of our study closely correlated with the studies of Caucasian populations.[11,13] In addition, Homma *et al*. reported results similar to Caucasian males from Asia and Australia in 1997.[14] The relatively minor differences may be due to population size, percentage of subjects in each age group that was evaluated and definition of urinary symptoms.

In our study, nocturia and incomplete emptying were the most prevalent symptoms, while hesitancy was the least. The prevalence of nocturia was consistantly high and similar in almost all of the series.[5–11,14,15] However, the other symptoms showed particular variation between the regions. Although IPSS questionnaires are popular and standardize the interpretation of LUTS, they have some limitations. Cultural and linguistic differences, and the mode of data collection can cause bias. Differences in perception and reporting of urinary symptoms may also contribute to this variance. Translation of IPSS may also yield problems. Although the Turkish Prostate Study Group validated the Turkish version of the IPSS form, this process may still not overcome all of the problems especially in complicated issues such as urgency (unpublished data). Nocturia, a symptom which does not require sophisticated understanding, seems to be correlated best amongst different cultures.

Quality of life is a very important criterion because it reflects the concerns of the patients and the real effect of the symptoms on the patients. Furthermore, it is one of the major factors that drive patients to seek medical care. In the present study, we found that the bother score was closely correlated with total IPSS. This observation is almost universal.[9,13,15] However, even in the severe symptomatic group, 22% of the individuals reported that urinary symptoms did not adversely affect their QOL. In the moderate symptomatic group, almost half of the patients had a bother score of <3. These observations may reflect the cultural habits of a specific population. In Turkey, people older than 50 years usually regard themselves as 'old' and readily accept the negative impact of LUTS on their QOL as their fate. This low bother score correlated very well with the low incidence of medical care seeking behavior. Only 16.2% of the individuals received medical care for their urinary symptoms. However, 60.4% of Spanish patients reported a significant impairment in their QOL when minor urinary symptoms were present compared to six percent in our study.[16] However, it must be pointed out that all of the patients in the aforementioned study had symptomatic BPH and that the study was not community-based. In the community-based studies from Spain and Netherlands with a similar design as ours, bother scores in the same symptom categories were similar.[9,13]

We have also found that further public education about LUTS and its consequences and treatment alternatives is required in the community.

In conclusion, the prevalence of LUTS in the Turkish community is fairly high, increases with age and has an impact on QOL that is not negligible.

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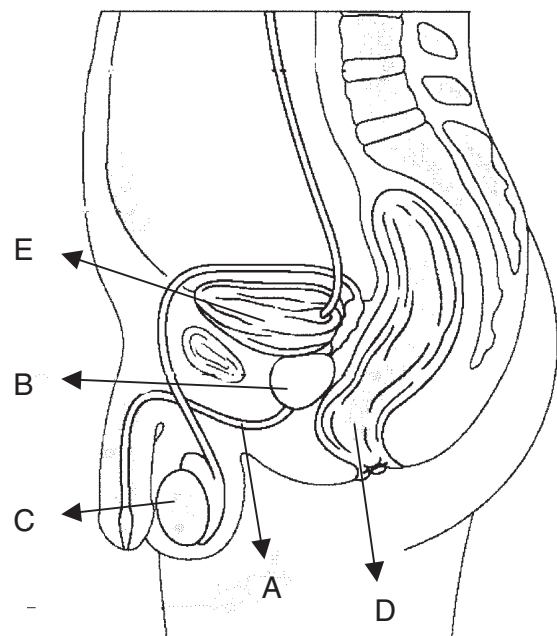
Appendix

Questionnaire for patients with lower urinary tract symptoms (LUTS)

Date:

Patient number:

Q1.   Name, family name:

Q2.   Date of birth:

Q3.   Marital status:

Q4.   Number of children:

Q5.   Educational status:

Q6.   Profession:

Q7.   Past medical history:

Q8.   What is the prostate? How does it function?

Q9.   Where is the prostate on this figure?

Q10. Have you ever sought medical care for urinary symptoms?

a) Yes

b) No

Q11. If the answer is 'yes', what kind of treatment modality was suggested?

a) Drugs

b) Surgery

c) Nothing

Q12. If the answer is 'drugs', which drug(s)?

Q13. Are there any people who have prostatic disease around you, and if there are, what kind of treatment modality was applied to them and what was the result?

Q14. What is the best treatment modality for prostate disease, according to you?
a) Open surgery
b) Endoscopic surgery
c) Laser surgery
d) Balloon dilatation
e) Drugs
f) Watchful waiting
g) I have no idea

Q15. If the results were 'equal', which of the following would you prefer?
a) Surgery
b) Drugs

Q16. If you were suggested to undergo an operation, which would be your choice?
a) Open
b) Endoscopic
c) I have no idea

Q17. If you were suggested to undergo an operation for prostatic disease, which of the following would worry you most?
a) Incontinence
b) Erectile dysfunction
c) Difficulties in ejaculation
d) Death during the operation
e) Not to obtain a good result from the operation

Q18. Where did you obtain the information about prostatic surgery?
a) Relatives (father, uncle, grandfather etc.)
b) Friends
c) Medical doctors
d) Media (newspapers, television)
e) Books and encyclopedias
f) I have no information

Q19. Please list the following operations according to their risk: life threatening (1); moderately risky (2); and free of risk.
a) Heart
b) Gallbladder
c) Prostate
d) Brain
e) Stomach
f) Hernia

International Prostate Symptom Score (IPSS)

Question	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	Score
1. Over the past month or so, how often have you had a sensation of not emptying your bladder completely after you finished urinating?	0	1	2	3	4	5	
2. Over the past month or so, how often have you had to urinate again less than 2 hours after you finished urinating?	0	1	2	3	4	5	
3. Over the past month or so, how often have you found you stopped and started again several times when you urinated?	0	1	2	3	4	5	
4. Over the past month or so, how often have you found it difficult to postpone urination?	0	1	2	3	4	5	
5. Over the past month or so, how often have you had a weak urinary stream?	0	1	2	3	4	5	
6. Over the past month or so, how often have you had to push or strain to begin urination?	0	1	2	3	4	5	
7. Over the past month or so, 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?	None 0	1 time 1	2 times 2	3 times 3	4 times 4	5 times 5	

Total IPSS score:

Quality of life (QOL) due to urinary problems

	Delighted	Pleased	Mostly satisfied	Mixed (about equally satisfied and dissatisfied)	Mostly dissatisfied	Unhappy	Terrible
If you were to spend the rest of your life with your urinary condition just the way it is now, how would you feel about that?	0	1	2	3	4	5	6

QOL evaluation index: