

## NATURAL HISTORY OF LOWER URINARY TRACT SYMPTOMS IN JAPANESE MEN FROM A 15-YEAR LONGITUDINAL COMMUNITY-BASED STUDY

### Hypothesis / aims of study

There are few data about the natural history of lower urinary tract symptoms (LUTS) suggestive of benign prostatic obstruction (BPO). Fifteen years ago, we performed a cross-sectional community-based study in men aged 40 to 79 in a small fishing village in Japan [1]. We found that LUTS worsened with age in the previous cross-sectional study. Although we reinvestigated their LUTS three years later, we did not find significant changes [2]. Next, we conducted a longitudinal survey again to clarify changes in LUTS after 15 years.

### Study design, materials and methods

In our previous study of the community-based population of 682 men, 319 (46.8%) participated, and 289 participants were eligible for evaluating LUTS. We sent survivors invitations for survey and performed examinations by the same method as in the initial survey. They completed a self-administered questionnaire asking about the frequency, using the International Prostate Symptom Score (IPSS), (0 to 35) and bother (bother score, 0 to 28) of urinary symptoms and the Quality of Life (QOL) Index (0 to 6), as well as medical history and current medication use. Moreover, they underwent digital rectal examination, serum prostate-specific antigen determination, uroflowmetry and transrectal ultrasonography. If the subject was already dead, we called his family, interviewed them about his medical history and checked his medical chart if necessary.

### Results

Of the 289 initial participants, 88 had died and 33 had moved away. Of the remaining 168, 125 men (74.4%) participated in the current study. Thirty-nine men were excluded from analysis because of prostate surgery, prostate cancer history, taking drugs for LUTS, lower back surgery and apoplexy during the 15 years. We could obtain information about medical history for 57 of the 88 deceased men (64.7%). There were 14 men having a history of undergoing transurethral resection of the prostate (TURP).

The IPSS, QOL index and bother score tended to increase in all of the age categories, and changes in the former two were significant (paired t-test,  $p < 0.001$ ) (Table 1). In the men in their 50s at baseline, changes in all three scores were significant.

We observed a mean increase in the IPSS of 0.13 points per year (95% CI 0.05-0.20). In the individual symptoms, there were significant changes in urgency, slow stream and nocturia (Table 2). Changes in urgency and nocturia were also significant in bother scores.

Of the 14 men who underwent TURP, 1, 4, 6 and 3 were men in their 40s, 50s, 60s and 70s at baseline, respectively. We investigated backgrounds in comparison of the TURP group (14 men) and non-TURP group (86 men). Although prostate volume, maximum flow rate, age and IPSS at baseline were significantly different between the two groups on univariate analysis, the IPSS was the only significant variable on multivariate analysis (logistic regression analysis,  $p=0.011$ ).

Table 1. Comparison of IPSS, bother score, and QOL index between baseline and follow-up studies

Age at baseline	number	Baseline	(95% CI)	Follow-up	(95% CI)	P value *
<b>IPSS(0-35)</b>						
40-49	(n =28)	6.7	(5.4- 8.0)	7.8	(6.1- 9.6)	0.273
50-59	(n =25)	5.0	(3.4- 6.6)	7.2	(5.4- 9.0)	0.004
60-69	(n =26)	7.1	(5.2- 9.0)	9.4	(7.5-11.3)	0.019
70-79	(n = 7)	10.0	(4.3-15.8)	11.4	(3.9-18.9)	0.665
Total	(n= 86)	6.6	(5.7- 7.5)	8.4	(7.4- 9.5)	0.001
<b>Bother score (0-28)</b>						
40-49	(n =28)	3.1	(1.8- 4.5)	4.0	(2.6- 5.5)	0.263
50-59	(n =25)	2.2	(1.0- 3.4)	4.7	(2.4- 7.0)	0.004
60-69	(n =26)	4.8	(2.3- 7.2)	4.7	(2.5- 6.9)	0.936
70-79	(n = 7)	5.9	(0.3-11.4)	7.0	(0.8-13.2)	0.627
Total	(n= 86)	3.6	(2.6- 4.6)	4.7	(3.6- 5.7)	0.067
<b>QOL (0-6)</b>						
40-49	(n =28)	1.9	(1.3- 2.5)	2.0	(1.5- 2.6)	0.646
50-59	(n =25)	1.2	(0.8- 1.6)	2.3	(1.6- 2.9)	0.002
60-69	(n =26)	1.6	(1.2- 2.1)	2.2	(1.6- 2.7)	0.060
70-79	(n = 7)	2.7	(1.4- 4.0)	3.6	(2.7- 4.5)	0.045
Total	(n= 86)	1.7	(1.4- 2.0)	2.3	(2.0- 2.6)	0.001

\*(paired t-test)

Table 2. Changes in individual IPSS and bother score

	Mean change in IPSS (95% CI)		p-value *	Mean change in bother score (95% CI)		p-value *
Feeling of incomplete emptying	0.0	(-0.2-0.2)	0.747	0.0	(-0.3-0.2)	0.661
Daytime frequency	0.1	(-0.2-0.4)	0.489	0.2	( 0.0-0.5)	0.068
Intermittency	0.2	(-0.1-0.4)	0.243	0.0	(-0.3-0.5)	0.753
Urgency	0.3	( 0.1-0.6)	0.019	0.4	( 0.1-0.6)	0.009
Slow stream	0.5	( 0.2-0.8)	0.003	0.3	( 0.0-0.6)	0.055
Straining	0.2	(-0.1-0.4)	0.258	-0.1	(-0.2-0.1)	0.339
Nocturia	0.5	( 0.3-0.8)	0.000	0.3	( 0.1-0.6)	0.016

\*(paired t-test)

#### Interpretation of results

We demonstrated that three years of follow-up did not affect the net urinary symptoms [2]; however, we confirmed significant changes in the IPSS, bother score and QOL index in a 15-year longitudinal study. The fifties may be a period in which urinary status changes largely because all three scores were significant. In our previous cross-sectional study, we found that Japanese men had higher symptom and lower bother scores than American men. However, the annual mean increase in the IPSS of 0.13 in Japan was less than the 0.29 in the longitudinal study of Olmsted County [3].

Although slow stream and nocturia had the strongest associations with aging in the cross-sectional study in Olmsted County, all of the remaining symptoms also increased significantly in the longitudinal study. On the other hand, slow stream, urgency and nocturia increased significantly in both our cross-sectional and longitudinal studies.

#### Concluding message

This was the first study that demonstrated 15-year longitudinal changes in LUTS in Japan. We confirmed that symptoms worsened with age in Japanese men; in particular, changes in the IPSS and QOL index were significant. Symptoms of slow stream, urgency and nocturia were consistently significant in both the cross-sectional and longitudinal studies in Japanese men. Multivariate analysis showed that the baseline IPSS was the only significant variable to predict the necessity for TURP in the future.

#### References

1. The Journal of Urology (1995) 154; 391-395.
2. Urology (2003) 61; 956-960.
3. The Journal of Urology (2002) 168; 1446-1452.

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<b><i>Was this study approved by an ethics committee?</i></b>	<b>Yes</b>
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<b><i>Was the Declaration of Helsinki followed?</i></b>	<b>Yes</b>
<b><i>Was informed consent obtained from the patients?</i></b>	<b>Yes</b>