

EVALUATION OF LOWER URINARY TRACT SYMPTOMS AND HOW BOTHERSOME IT WAS WITH OR WITHOUT URINARY INCONTINENCE IN APPARENTLY HEALTHY PERSONS OF BOTH SEXES

Tomoyuki SHIMABUKURO¹ and Katsusuke NAITO²

¹*The Department of Urology, Ube Industries Central Hospital*

²*The Department of Urology, Graduate School of Medicine, Yamaguchi University*

We evaluated the effect of urinary incontinence on the degree of being bothersome in apparently healthy males and females by a questionnaire survey.

From March to May, 2003 apparently healthy subjects underwent multiphasic health screening after informed of the nature of this study and were asked to fill out the questionnaires of International Prostate Symptom Score (IPSS) with IPSS QOL index (IPSS-QI) and the short form version of the Urogenital Distress Inventory (UDI-6). The data were subjected to analytical studies.

Of the 388 participants who responded completely to both questionnaires, 172 (44.3%) had urinary incontinence; 143 were women (36.9%) and 29 men (7.5%). The mean age of the women was 46.0 years (range 18.0 to 76.0) and that of men was 47.5 years (range 22.0 to 76.0). Compared with continent participants, women and men with mixed urinary incontinence had a significantly higher IPSS severity ($P=0.0002$ and $P=0.0014$, respectively). In terms of contribution on QOL impairment, the women and men with mixed urinary incontinence considered it significantly more bothersome compared with continent participants ($P=0.0004$ and $P=0.0003$, respectively).

These data showed that urinary incontinence was relatively common among apparently healthy women, but not men, and type of incontinence had a different impact on the degree of being bothersome in both sexes.

(Hinyokika Kiyo **53**: 157–162, 2007)

Key words: Apparently healthy person, Both sexes, LUTS, Urinary incontinence, QOL

INTRODUCTION

The last taboo of modern urology is urinary incontinence and lower urinary tract symptoms (LUTS)¹⁾. Although urinary incontinence and LUTS affect more than 17 million Americans and more than 10 million Japanese, it is estimated that perhaps only 15% to 18 % of such patients have sought medical help^{2,3)}. In a recently performed community-based epidemiological survey, 25% of the participating adult women had urinary leakage and nearly 7% had significant incontinence. It was also reported that the prevalence of incontinence increased with increasing age and half of the incontinence was stress type, 11% had urge and 36% mixed incontinence⁴⁾. Urinary incontinence and LUTS, of course, have little or no impact on mortality, but interfere with participation in social activities thereby promoting social isolation and predisposing to depression.

Scoring systems have been developed to quantify LUTS so as to assess the severity and degree of bother of LUTS and their influence on quality of life. International Prostate Symptom Score (IPSS) is one of the most popular self-administered questionnaires in which seven symptoms are scored from 0 to 5⁵⁾. In this

study, we also used a short form version of the Urogenital Distress Inventory (UDI-6) questionnaire for evaluating urinary incontinence in apparently healthy persons of both sexes⁶⁾. The aim of this investigation was to evaluate the impact of urinary incontinence on being considered bothersome.

PARTICIPANTS AND METHODS

Participants

From March to May, 2003 apparently healthy subjects underwent multiphasic health screening in our Medical Checkup Center of Ube Industries Central Hospital after informed of the nature of this study and were asked to fill out the questionnaires of International Prostate Symptom Score (IPSS) with IPSS QOL index (IPSS-QI)⁵⁾ and the short form version of the Urogenital Distress Inventory (UDI-6)⁶⁾. The IPSS questionnaires were translated into Japanese by the Japanese Urological Association⁷⁾. The UDI-6 questionnaire was translated into Japanese by one of us (TS). The institutional review board approved the study because these questionnaires were anonymous, and participants were requested to disclose only their age and sex. In the present study, therefore, data from the questionnaires and health screening could not be linked together,

and no information could be obtained on past and concurrent disease or medications.

All participants were Japanese and lived in or around Ube city.

Terminology

We followed the Standardisation of Terminology of Lower Urinary Tract Function by the International Continence Society⁸⁾.

The severity of symptoms according to total IPSS was classified as none (score of 0), mild (1 to 7), moderate (8 to 19), and severe (20 to 35); the QOL score was categorized as mild (0 to 1), moderate (2 to 4), and severe (5 to 6).

We considered the response as urge incontinence when the person ticked off any response level except "not at all" of the item 2 in the UDI-6 questionnaire. Also we considered the response as stress incontinence when a person ticked off any response level except "not at all" of item 3 and 4. Mixed incontinence denoted if a person ticked off concurrently response levels from "slightly" to "greatly" of item 2 and 3, or item 2 and 4.

Statistical Study

The differences between women and men in the total IPSS score as well as the IPSS-QI were analyzed by the Mann-Whitney's U test. The differences of frequency between woman and man in the urge, stress, and mixed incontinence were analyzed by the chi-square test for independence. The difference between each urinary incontinence and continence by gender in the total IPSS scores and IPSS-QI were analyzed by the Post-hoc tests.

A probability (*P*) value of less than 0.05 was considered statistically significant.

RESULTS

Participants

The 625 apparently healthy subjects who responded to all seven items of the IPSS from March to May, 2003 were enrolled in this study. Three hundred and eighty-eight participants of them also responded to the UDI-6 {response rate=388/625 (62.1%)}. Of the participants who responded completely to both questionnaires, 215

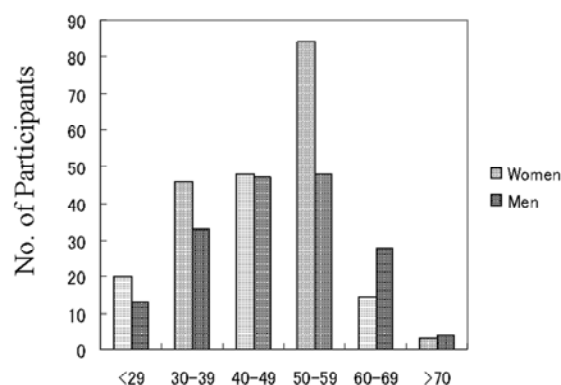


Fig. 1. Age distribution of apparently healthy participants.

(55.4%) were women, and 173 (44.6%) were men. The mean age of the women who answered every question in both questionnaires was 46.0 years (range 18.0 to 76.0) and that of men was 47.5 years (range 22.0 to 76.0). In both sexes, participants in the 6th decade represented the most numerous age group (Fig. 1).

Prevalence of Incontinence by Age Group and Gender

Table 1 shows each urinary incontinence prevalence in both sexes according to decade. Of the 388 participants who responded completely, 172 (44.3%) had urinary incontinence: 143 were women (36.9%) and 29 men (7.5%).

Only 5 (2.3%) women and 8 (4.6%) men had pure urge incontinence. There was no significant difference in the prevalence among women and men ($P=0.211$).

Pure stress incontinence was evident in women. Of the 215 women, 96 (44.7%) respondents had stress incontinence and there was a significant difference of the prevalence among women and men ($P<0.0001$).

Mixed incontinence was also significantly more evident among women than among men ($P<0.0001$).

Total International Prostate Symptom Scores by Incontinence Status and Gender

The mean (25th, 75th percentile) IPSS total score was 4.60 (2.00, 6.00) in women and 6.78 (2.00, 10.00) in men. The mean IPSS total scores were significantly higher among the respondents with incontinence than among

Table 1. Distribution of participants with urinary incontinence by age group in women and men. All *P* values for women versus men in each status of urinary incontinence.

Women						Men				
Status by Continence	n	Urge	Stress ^{*1}	Mixed ^{*2}	Continence	n	Urge	Stress ^{*1}	Mixed ^{*2}	Continence
Status by Age										
<29	20	—	6 (30.0)	—	14 (70.0)	13	—	1 (7.7)	—	12 (92.3)
30-39	46	—	16 (34.8)	8 (17.4)	22 (47.8)	33	—	—	—	33 (100.0)
40-49	48	1 (2.1)	24 (50.0)	10 (20.8)	13 (27.1)	47	4 (8.5)	3 (6.4)	4 (8.5)	36 (76.6)
50-59	84	3 (3.6)	43 (51.2)	19 (22.6)	19 (22.6)	48	2 (4.2)	5 (10.4)	4 (8.3)	37 (77.1)
60-69	14	1 (7.1)	5 (35.7)	5 (35.7)	3 (21.4)	28	1 (3.6)	1 (3.6)	2 (7.1)	24 (85.7)
>70	3	—	2 (66.7)	—	1 (33.3)	4	1 (25.0)	1 (25.0)	—	2 (50.0)
Total	215	5 (2.3)	96 (44.7)	42 (19.5)	72 (33.5)	173	8 (4.6)	11 (6.4)	10 (5.8)	144 (83.2)

KEY: Data in parentheses are percentage within each decade. *¹; $P<0.0001$, *²; $P<0.0001$.

Table 2. Distribution of four categories of IPSS severity according to each status of urinary incontinence in women and men. All *P* values by gender.

Women						Men				
IPSS score	n	None	Mild	Moderate	Severe	n	None	Mild	Moderate	Severe
Status by Continence										
Urge	5	—	5 (100.0)	—	—	8	—	4 (50.0)	4 (50.0)	—
Stress	96	12 (12.5)	70 (72.9)	14 (14.6)	—	11	—	7 (63.6)	4 (36.4)	—
Mixed ^{*,*2}	42	—	27 (64.3)	15 (35.7)	—	10	—	3 (30.0)	4 (40.0)	3 (30.0)
Conti. ^{*,*2}	72	11 (15.3)	53 (73.6)	6 (8.3)	2 (2.8)	144	13 (9.0)	87 (60.4)	39 (27.1)	5 (3.5)
Total	215	23 (10.7)	155 (72.1)	35 (16.3)	2 (0.9)	173	13 (7.5)	101 (58.4)	51 (29.5)	8 (4.6)

KEY : IPSS=International Prostate Symptom Score. Conti=continent. Data in parentheses are percentage within each status. Category of IPSS severity : none (total IPSS score of 0), mild (1 to 7), moderate (8 to 19), and severe (20 to 35). *1 (for women) ; *P* =0.0002, *2 (for men) ; *P*=0.0014.

Table 3. Distribution of three categories of bothersome according to urge, stress and mixed urinary incontinence in women and men. All *P* values by gender.

		Women			Men			
IPSS-QI	n	Mild	Moderate	Severe	n	Mild	Moderate	Severe
Status by Continence								
Urge	5	3 (60.0)	2 (40.0)	—	8	—	8 (100.0)	—
Stress	96	64 (66.7)	31 (32.3)	1 (1.0)	11	4 (36.4)	7 (63.6)	—
Mixed ^{*1,*2}	42	11 (26.2)	30 (71.4)	1 (2.4)	10	1 (10.0)	5 (50.0)	4 (40.0)
Conti. ^{*1,*2}	72	43 (59.7)	27 (37.5)	2 (2.8)	144	73 (50.7)	64 (44.4)	7 (4.9)
Total	215	121 (56.3)	90 (41.9)	4 (1.9)	173	78 (45.1)	84 (48.5)	11 (6.4)

KEY : IPSS-QI=International Prostate Symptom Score QOL Index. Conti=continent. Data in parentheses are percentage. Category of bothersome : mild (IPSS-QI of 0 to 1), moderate (2 to 4), and severe (5 to 6). *1 (for women) ; *P*=0.0004, *2 (for men) ; *P*=0.0003.

those with continence in women and men.

Table 2 shows the IPSS severity in both sexes according to each continent status. Compared with continent participants, women and men with mixed urinary incontinence had a significantly higher IPSS severity (*P*=0.0002 and *P*=0.0014, respectively). Except for 3 men with mixed incontinence, no participants with urinary incontinence had severe IPSS severity in this study.

Quality of Life Index by Incontinence Status and Gender

Table 3 shows the distribution of categories of bothersomeness in both sexes according to each continent status. Compared with continent participants, women and men with mixed urinary incontinence felt significantly more bothered (*P*=0.0004 and *P*=0.0003, respectively). Men with urinary incontinence, generally considered it bothersome more than men with urinary continence.

DISCUSSION

Urinary incontinence and LUTS, of course, have little or no impact on mortality, but interfere with participation in social activities thereby promoting social isolation and predisposing to depression. Homma et al reported that the proportion of cases experiencing

symptoms (> once per week/> once a day) of urge incontinence was 8.9%/5.3% and that of stress incontinence was 8.0%/3.9%. The most problematic symptom was stress incontinence for 14.5% of their responses and urge incontinence for 9.8% of them. They also found that the prevalence of urge incontinence increased with age and was generally larger in men but that of stress incontinence was not³⁾. Our study was not a population-based study and the enrolled participants were derived from a health screening population, hence the proportion of women and men aging 70 years or older was very small (Fig. 1). Because the prevalence of urinary incontinence (44.3%) was higher than that in the aforementioned report, the present study may not reflect the general prevalence of urinary incontinence in the Japanese population. This is a potential limitation of our study.

Very interestingly, among women, almost 75% of middle-aged participants (40–59 years old) complained of some urinary incontinence, and stress incontinence was dominant among 40 to 59 years old but in women older than 60 years mixed incontinence became evident. The reasons for the higher urinary incontinence rates in our participants than in the previous report by Homma et al. was obscure but might be due to the difference in

the questionnaire used, population and response rates. Among men, the prevalence of urinary incontinence was low (Table 1).

The total IPSS score was significantly higher among the respondents with urinary incontinence than among those with urinary continence in both sexes. Especially, compared with continent participants, women and men with mixed urinary incontinence had a significantly higher IPSS severity (Table 2). Our findings well correlated with other reports and reconfirmed that urinary incontinence was one of the most problematic symptom^{3,9)}.

Of course, at any age, urinary continence depends on adequate mobility, mentation, motivation, manual dexterity, and intact lower urinary tract function. Urinary incontinence in younger persons is rarely associated with disorders outside the urinary tract, such disorders are common in elderly persons. Among women and men 65 years of age or older, the most common cause of urinary incontinence is detrusor dysfunction, which also causes lower urinary tract symptoms similar to those due to benign prostatic hyperplasia (BPH). Our data indicated that approximately 37% of apparently healthy women complained of some degree of incontinence, especially stress incontinence, whereas less than 8% of apparently healthy men, complained of incontinence. Because stress incontinence is uncommon in men, the usual problem is differentiating detrusor overactivity from obstruction. In these persons, uroflometry may be helpful. It is also reported that incontinence is transient in up to one-third of community-dwelling elderly persons¹⁰⁾.

How is urinary incontinence associated with QOL? Our data indicated that the mean IPSS-QI was significantly greater in men than in women. In women, urinary incontinence is not associated with QOL impairments except for mixed urinary incontinence. There were some discrepancies between our data and a previous report by Homma et al. The reasons might be that our participants were younger, had milder symptoms and were mainly population based. On the other hand, men with incontinence, especially men with mixed urinary incontinence, considered it more bothersome than men with continence. In the present study, we did not determine whether men with urinary incontinence also had BPH. If men with urinary incontinence were more likely to have BPH, then our IPSS-QI findings would be biased. These findings would suggest that the type of incontinence had different source(s) in both sexes. Urge incontinence in men might be a symptom of occult BPH and/or so-called overactive bladder. On the contrary, stress incontinence occurred commonly in apparently healthy women and it did not seem to be bothersome to them.

CONCLUSION

We aimed to evaluate the effect of urinary

incontinence on how bothersome it was in apparently healthy persons in both sexes.

Of the 388 participants who responded completely to both questionnaires, 172 (44.3%) had urinary incontinence: 143 women (36.9%) and 29 men (7.5%). Compared with continent participants, women and men with mixed urinary incontinence had a significantly higher IPSS severity. In terms of contributing to QOL impairments, women and men with mixed urinary incontinence considered it significantly more bothersome compared with continent participants.

These data showed that urinary incontinence was relatively common among apparently healthy women, but not men, and the type of incontinence had a different impact on how bothersome it was in both sexes.

ACKNOWLEDGMENT

The authors would like to thank R.Ns. Megumi Maeda and Yoko Yamada for their expert assistance.

APPENDIX

*Urogenital Distress Inventory-Short Form (UDI-6)*⁶⁾

Do you experience, and, if so, how many are you bothered by:

1. Frequent urination?
2. Urine leakage related to the feeling of urgency?
3. Urine leakage related to physical activity, coughing, or sneezing?
4. Small amounts of urine leakage (drops)?
5. Difficulty emptying your bladder?
6. Pain or discomfort in the lower abdominal or genital area?

Item response levels are: (0) not at all; (1) slightly; (2) moderately; (3) greatly.

REFERENCES

- 1) Voelker R: International group seeks to dispel incontinence "taboo". *JAMA* **280**: 951, 1998
- 2) Yoshimura N and Chancellor MB: Current and future pharmacological treatment for overactive bladder. *J Urol* **168**: 1897-1913, 2002
- 3) Homma Y, Kakizaki H, Gotoh M, et al.: Epidemiology survey on lower urinary tract symptoms in Japan. *J JNBS* **14**: 266-277, 2003
- 4) Hannestad YS, Rortveit G, Sandvik H, et al.: A community-based epidemiological survey of female urinary incontinence: the Norwegian EPINCONT study. Epidemiology of incontinence in the county of Nord-Trondelag. *J Clin Epidemiol* **53**: 1150-1157, 2000
- 5) Cockett ATK, Aso Y, Denis L, et al.: The second international consultation on benign prostatic hyperplasia (BPH). In: The second international consultation on benign prostatic hyperplasia (BPH). Edited by Cockett ATK, Aso Y, Chatelain

- C, et al. : pp 553, Scientific Communication International, Paris, 1994
- 6) Uebersax JS, Wyman JF, Shumaker SA, et al. : The incontinence impact questionnaire and the urogenital distress inventory. *Neurourol Urodyn* **14** : 131-139, 1995
 - 7) Homma Y, Tsukamoto T, Yasuda K, et al. : Linguistic validation of Japanese version of international prostate symptom score and BPH impact index. *Jpn J Urol (in Japanese)* **93** : 669-680, 2002
 - 8) Abrams P, Cardozo L, Fall M, et al. : The standardization of terminology of lower urinary tract function : report from the standardization subcommittee of the International Continence Society. *Neurourol Urodyn* **21** : 167-178, 2002
 - 9) Terai A, Matsui Y, Ichioka K, et al. : Comparative analysis of lower urinary tract symptoms and bother in both sexes. *Urology* **63** : 487-491, 2004
 - 10) Resnik NM : Urinary incontinence. *Lancet* **346** : 94-99, 1995

(Received on May 1, 2006)
 (Accepted on November 26, 2006)

和文抄録

当院健診センターを受診した男女における
尿失禁の有無別下部尿路症状および困窮度の検討島袋 智之¹, 内藤 克輔²¹宇部興産中央病院泌尿器科²山口大学医学部特殊専門領域腫瘍病態学教室（泌尿器科）

健康診断のために当院の健診センターを訪れた男女に、国際前立腺症状スコア（IPSS）と生活の質の指標（IPSS-QI）および泌尿生殖器関連困窮度調査表（UDI-6）を用いたアンケート調査を行い、通常の日常生活を送っている人々における下部尿路症状（LUTS）と尿失禁症状の出現頻度、および尿失禁症状の LUTS と IPSS-QI に与える影響を検討した。

対象となった388人の中、172人（44.3%）が何らかの尿失禁症状を有していた。その中143人が女性（36.9%）で、29人が男性（7.5%）であった。女性の平均年

齢は46.0歳、男性の平均年齢は47.5歳であった。尿禁制者に比べ、混合性尿失禁を有する男女において IPSS 重篤度は有意に高く、一方、生活の質に及ぼす影響では、混合性尿失禁を有する男女は、尿禁制者に比べ有意に強い困窮度を訴えていた。

得られた結果は、尿失禁は通常の日常生活を送る女性においては、男性とは異なり、比較的ありふれた症状であり、また尿失禁の型は異なる困窮度を男女共に与えることを示していた。

（泌尿紀要 **53** : 157-162, 2006）