ORIGINAL ARTICLE

Relationship between each IPSS item score and erectile dysfunction in the Korean Internet Sexuality Survey (KISS): do men with weak streams have low sexual function?

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Abstract

Objectives The current results show that lower urinary tract symptoms (LUTS) and erectile dysfunction (ED) are co-prevalent conditions. The objective of this study was to determine which LUTS among seven items on the International Prostate Symptom Scores (IPSS) were related to ED in the general population.

Methods The Korean Internet Sexuality Survey was performed in 2006 and 2016. We sent emails and surveyed the panelists registered at an Internet survey agency. The inclusion criteria were sexually active men aged between 20 and 69. Data, including the International Index of Erectile Function-5 (IIEF-5) and IPSS scores were extracted from the surveys. Logistic regression analyses were performed to determine the factors related to 'any degree of ED' (IIEF-5 < 22) or 'more than mild ED' (IIEF-5 < 17).

Results The mean age of 1464 men was 39.2 ± 11.4 years. The mean total IPSS and IIEF-5 scores were 7.2 ± 6.5 and 20.8 ± 3.3 points, respectively. The IIEF-5 and total IPSS scores showed significant negative relationships ($r = -0.251$, $p < 0.001$). Among the seven IPSS items, IPSS 5 (weak stream, $r = -0.243$, $p < 0.001$) was most strongly correlated with the IIEF-5 scores. On multivariate analysis, IPSS 3 (intermittency, OR 0.160, 95% CI 1.010–1.333, $p = 0.035$) and IPSS 7 (nocturia, OR 1.238, 95% CI 1.077–1.423, $p = 0.003$) were significantly related to 'any degree of ED'. 'More than mild ED' was significantly related to IPSS 5 (weak stream, OR 1.267, 95% CI 1.058–1.518, $p = 0.010$).

Conclusions Every LUTS listed in the IPSS items was negatively correlated with erectile function. Among the seven IPSS items, IPSS 5 (weak stream) was the most related to 'more than mild ED'.

Keywords Lower urinary tract symptoms · Erectile dysfunction · Internet

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Introduction

Lower urinary tract symptoms (LUTS) and erectile dysfunction (ED) are prevalent conditions with significant impacts on men's health [1]. The prevalence of these two conditions increases with aging [2]. Epidemiologic studies worldwide have confirmed a relationship between these two conditions [3].

The relationship between LUTS and ED has been attributed to the similar pathophysiological pathways shared by these two conditions, rather than direct effects on each other [4]. They also have common risk factors, such as metabolic syndrome, obesity, hypertension, and diabetes [5]. Treatment with a phosphodiesterase type 5 inhibitor (PDE5I) was reported to improve LUTS in patients with benign prostatic hyperplasia (BPH) [6]. Interestingly, the combined treatment of LUTS with PDE5I and an alpha-blocker improved the

maximum flow rate on uroflowmetry compared to alpha-blocker monotherapy in some randomized–controlled studies [7].

A few studies evaluated which urinary symptoms were related to ED, showing inconsistent results [8–12]. One study reported that only storage symptoms were significantly related to ED, whereas another study reported that only voiding symptoms were significant predictive factors for ED [11, 12]. These studies showed that each LUTS was correlated with ED. However, multivariate analysis with one model including every LUTS to compare which factor is more significantly associated with ED, while adjusting for collinearity, has not been reported yet.

The subjects of some previous studies showing a relationship between LUTS and ED were patients who visited urology clinics [10]. Men with LUTS or men with ED are more likely to visit urologists [13]. Furthermore, these patients are more likely to receive prostate biopsies and to be diagnosed with other urologic disorders [14]. These factors can be a source of bias in evaluating the relationship between LUTS and ED.

Thus, the objective of this study was to evaluate which LUTS on the International Prostate Symptom Scores (IPSS) were related to ED in a web-based general population survey.

Materials and methods

The data for this study were extracted from the Korean Internet Sexuality Survey (KISS) performed in 2006 and 2016 with a 10-year interval [15, 16]. These nationwide surveys included sexually active men in their 20–50s in the 2006 survey and those in their 20–60s in the 2016 survey. The primary endpoint of the KISS was the prevalence of ED and the risk factors for ED. The final number of subjects was 601 in 2006 and 900 in 2016. After combining the two study populations and excluding those with renal disease (n = 37), because renal disease might deteriorate LUTS, a total of 1464 men were included in this analysis.

The first KISS was performed as a web-based survey in 2006 [15]. The second KISS was repeated in 2016 with the same methodology [16, 17]. The second study was repeated to investigate changes in ED prevalence and to elucidate the changes according to age groups associated with sociocultural transitions and the alterations in risk factors accompanying them. These studies were conducted with panels registered with the same company. The participants were recruited by emailing the panel members extracted using a proportional quota sampling method. Only those men who answered all questionnaire items were included in the final analysis. When the mean response time was below 10%, the data were regarded as unfaithful and automatically excluded. The response rate to each survey was 15.1% in 2006 and 35.0% in 2016. The survey consisted of 111 questions in Korean. First, general demographics, including age, body mass index, smoking status, drinking status, sexual history, and general health problems, were surveyed. Second, erectile function using the International Index of Erectile Function-5 (IIEF-5) questionnaires and LUTS using the IPSS questionnaires were assessed.

Erectile function was classified by IIEF-5 scores (normal, 22–25; mild ED, 17–21; mild-to-moderate ED, 12–16; moderate ED, 8–11; and severe ED, 5–7 points). In this study, men with IIEF between 17 and 21 were defined as mild ED and men with IIEF-5 < 17 were defined as 'more than mild ED', because this cut-off value was well correlated with self-reported ED. To evaluate the influence of each IPSS item on ED, a comparison of each IPSS item score between men with normal erectile function and men with 'any degree of ED' was performed. In addition, a comparison between 'more than mild ED' and others was also performed to evaluate the effect of LUTS on clinically significant ED.

All statistical analyses were performed using PASW statistics version 17.0 (SPSS, Chicago, IL, USA). The data are presented as the mean ± standard deviation. Median with interquartile ranges are also presented for nonparametric values. All hypotheses were evaluated in a two-sided manner and $p < 0.05$ was considered statistically significant. To evaluate the correlation between IPSS scores and IIEF-5 scores, Pearson's correlation analysis was performed. Partial correlation analysis was used to adjust for the influence of age. Univariate and multivariable logistic regression analyses were conducted to determine the odds ratios and 95% confidence intervals and identify factors related to ED. Variables with a p value of < 0.05 in univariate analysis were included in the multivariable model. The evaluated variables were age, height, weight, BMI, hypertension, diabetes, liver disease, depression, smoking, alcohol consumption, education level, income, marital status, vasectomy, circumcision, and all IPSS items.

Results

The mean age of the 1464 men in the study was 39.2 ± 11.4 years. The characteristics of these subjects are presented in Table 1. The proportion of men with any degree of ED was 48.4% and the proportion of men with more than mild ED (IIEF-5 < 17) was 12.3%. The proportion of men with mild ED in each decade were 32.3% (20s), 34.1% (30s), 36.8% (40s), 40.9% (50s), and 44.8% (60s). The proportion of men with more than mild ED in each decade were 10.4% (20s), 7.6% (30s), 9.8% (40s), 21.1% (50s), and 28.2% (60s) (Supplementary Table 1).

The mean total IPSS score was 7.2 ± 6.5 points. The proportion of men with moderate or severe LUTS in

Table 1 Characteristics of the study population

Variables	Value
Study year	
2006	594 (40.6%)
2016	870 (59.4%)
Age decade	
20s	356 (24.3%)
30s	460 (31.4%)
40s	315 (21.5%)
50s	237 (16.2%)
60s	96 (6.6%)
BMI	24.0 ± 2.7
Marital status	
Single	687 (46.9%)
Married	750 (51.2%)
Divorced or bereaved	27 (1.9%)
Smoking history	
None	560 (38.2%)
Past	240 (16.4%)
Present	664 (45.4%)
Alcohol consumption	
None	314 (21.4%)
< 30 g/day	742 (50.7%)
≥ 30 g/day	408 (27.9%)
Co-morbidity	
Hypertension	216 (14.8%)
Diabetes	104 (7.1%)
Prostatic disease	61 (4.2%)
Liver disease	70 (4.8%)
Depression	57 (3.9%)
The highest level of education	
High School or less	186 (12.7%)
College or more	1278 (87.3%)
Monthly income ≥ 3521 USD (1 USD = 1136 won)	493 (33.7%)
IIEF-5	
Scores[a]	20.8 ± 3.3 (22.0, 19.0–23.0)
Normal	756 (51.6%)
Mild ED	528 (36.1%)
Mild-to-moderate ED	158 (10.8%)
Moderate ED	18 (1.2%)
Severe ED	4 (0.3%)
IPSS scores	
IPSS 1 (incomplete emptying)[a]	1.2 ± 1.3 (1.0, 0.0–2.0)
IPSS 2 (frequency)[a]	1.4 ± 1.3 (1.0, 0.0–2.0)
IPSS 3 (intermittency)[a]	1.0 ± 1.2 (1.0, 0.0–2.0)
IPSS 4 (urgency)[a]	0.9 ± 1.1 (1.0, 0.0–1.0)
IPSS 5 (weak stream)[a]	1.1 ± 1.3 (1.0, 0.0 – 2.0)
IPSS 6 (straining)[a]	0.8 ± 1.1 (0.0, 0.0–2.0)
IPSS 7 (nocturia)[a]	0.8 ± 0.9 (1.0, 0.0–1.0)
Qol[a]	1.7 ± 1.5 (1.0, 0.0–3.0)
Voiding score sum[a]	4.2 ± 4.2 (3.0, 1.0–6.0)

Table 1 (continued)

Variables	Value
Storage score sum[a]	3.0 ± 2.7 (2.0, 1.0–5.0)
Total score[a]	7.2 ± 6.5 (5.0, 2.0–11.0)
Vasectomy	146 (10.0%)
Circumcision	990 (67.6%)

BMI body mass index, *IIEF* international index of erectile function, *ED* erectile dysfunction, *IPSS* international prostate symptom score, *Qol* quality of life

[a]Nonparametric value were presented mean ± standard deviation (median, interquartile ranges)

each decade were 27.5% (20s), 30.0% (30s), 40.0% (40s), 51.2% (50s), and 61.5% (60s) (Supplementary Table 2). The mean scores of voiding symptom items (IPSS 1, 3, 5, and 6) and storage symptom items (IPSS 2, 4, and 7) were similar, ranging from 0.8 to 1.4 points. Men with mild ED had higher IPSS scores on each item, voiding score sums, storage score sums, and total IPSS scores than men without ED. Among the IPSS items, IPSS 5 (weak stream) showed the most linear increase. The scores, except for IPSS item 2, were even higher in men with more than mild ED than those in men with mild ED. As the severity of ED increased, the total IPSS scores also increased. The increase in voiding score sums was more remarkable than that in the storage voiding sums (Fig. 1).

The age-adjusted partial correlation coefficient for total IPSS scores with IIEF-5 scores was -0.251 ($p < 0.001$) (Table 2). Among all IPSS items, IPSS 5 (weak stream, $r = -0.243$, $p < 0.001$) was most strongly correlated with IIEF-5 scores, followed by IPSS 1 (incomplete emptying, $r = -0.209$, $p < 0.001$).

In univariate analysis, every IPSS item was a significant factor related to 'any degree of ED'. On multivariate analysis, increases in age, the presence of diabetes or depression, and drinking more than 30 g of alcohol per day were significant risk factors. High IPSS 3 scores (intermittency, OR 1.160, 95% CI 1.010–1.333, $p = 0.035$) and high IPSS 7 scores (nocturia, OR 1.238, 95% CI 1.077–1.423, $p = 0.003$) remained significant factors associated with any degree of ED (Table 3).

Every IPSS item except IPSS 2 (frequency) was also a significant factor related to 'more than mild ED' on univariate analysis. On multivariate analysis, increases in age, the presence of diabetes or depression, and non-circumcision state were significant risk factors. Among IPSS items, only high IPSS 5 scores (weak stream, OR 1.238, 95% CI 1.077–1.423, $p = 0.010$) were a significant factor associated with more than mild ED after adjusting for other risk factors (Table 4).
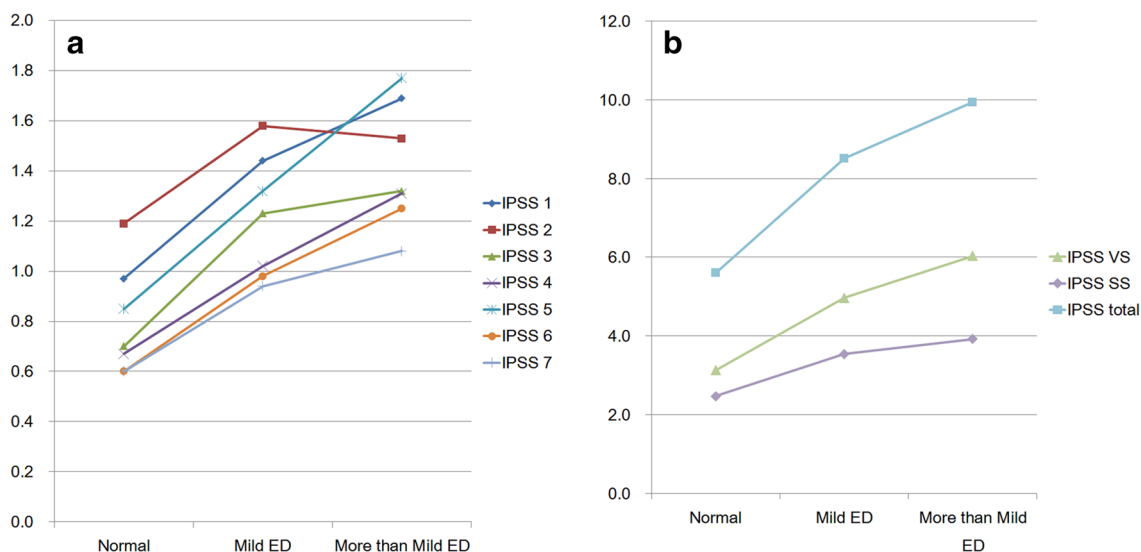
Fig. 1 Mean IPSS scores according to the severity of erectile dysfunction. **a** Each IPSS items mean score, **b** sum of the mean voiding symptoms (VS) scores, sum of the mean storage symptoms (SS) scores, and the mean total IPSS scores. This graph shows that each IPSS scores, voiding score sum, storage score sum, and total IPSS scores increased with the severity of ED. *IPSS* international prostate symptom score, *ED* erectile dysfunction; IPSS 1, incomplete emptying; IPSS 2, Frequency; IPSS 3, intermittency; IPSS 4, urgency; IPSS 5, weak stream; IPSS 6, straining; IPSS 7, nocturia; Normal, IIEF-5 score > 21; mild ED, IIEF score 17–21; more than mild ED, IIEF-5 score < 17 points

Table 2 Correlation between each IPSS item score and IIEF-5 score

	Pearson correlation coefficient	p Value	Partial correlation coefficient[a]	p Value
IPSS 1 (incomplete emptying)	−0.241	<0.001	−0.209	<0.001
IPSS 2 (frequency)	−0.143	<0.001	−0.136	<0.001
IPSS 3 (intermittency)	−0.223	<0.001	−0.188	<0.001
IPSS 4 (urgency)	−0.211	<0.001	−0.198	<0.001
IPSS 5 (weak stream)	−0.286	<0.001	−0.243	<0.001
IPSS 6 (straining)	−0.228	<0.001	−0.204	<0.001
IPSS 7 (nocturia)	−0.198	<0.001	−0.184	<0.001
IPSS Qol	−0.243	<0.001	−0.201	<0.001
Voiding score sum	−0.287	<0.001	−0.249	<0.001
Storage score sum	−0.223	<0.001	−0.210	<0.001
Total IPSS scores	−0.282	<0.001	−0.251	<0.001

IPSS international prostate symptom score, *Qol* quality of life

[a]Age-adjusted partial correlation coefficient

Discussion

Previous studies have evaluated the relationship between each urinary symptom and ED and reported inconsistent results [8–12]. One population-based study in Finland reported that ED was strongly associated with the severity of LUTS and their bothersomeness [8]. Among LUTS, nocturia (OR 1.5), weak stream (OR 1.5), stress incontinence (OR 2.1), and overflow incontinence were significantly associated with ED. However, the bother of

LUTS affected ED more than the symptoms itself, emphasizing the potential of psychological mechanisms of ED. In that study, LUTS was assessed using the Danish Prostatic Symptom Score (DAN-PSS-1) questionnaire and only men aged 55, 65, and 75 years were included.

A nationwide community-based survey in France involving men aged between 50 and 80 years showed that men with moderate LUTS had a twofold risk of sexual dissatisfaction [9]. Among moderate LUTS (each IPSS score 1–3), only urgency (OR 1.71) and dribbling (OR 1.72) were related to sexual life satisfaction. Whereas, among severe LUTS

Table 3 Multivariate analysis for factors related to any degree of ED (IIEF-5 ≤ 21)

	Univariate			Multivariate		
	OR	95% CI	p Value	OR	95% CI	p Value
Age	1.033	1.023–1.042	< 0.001	1.019	1.008–1.029	0.001
Hypertension	2.056	1.526–2.771	< 0.001	1.303	0.931–1.825	0.123
Diabetes	2.825	1.824–4.374	< 0.001	1.826	1.135–2.940	0.013
Depression	2.843	1.580–5.114	< 0.001	2.109	1.129–3.941	0.019
Smoking (past or current)	1.431	1.158–1.77	0.001	1.114	0.877–1.416	0.375
Alcohol consumption			0.002			0.035
None	ref	ref	ref	ref	ref	ref
< 30 g/day	1.298	0.994–1.695	0.055	1.189	0.888–1.592	0.245
≥ 30 g/day	1.706	1.267–2.297	< 0.001	1.525	1.096–2.123	0.012
IPSS 1	1.404	1.288–1.530	< 0.001	1.087	0.954–1.239	0.210
IPSS 2	1.259	1.160–1.367	< 0.001	0.982	0.876–1.101	0.753
IPSS 3	1.487	1.356–1.631	< 0.001	1.160	1.010–1.333	0.035
IPSS 4	1.429	1.294–1.577	< 0.001	1.061	0.922–1.221	0.410
IPSS 5	1.418	1.304–1.543	< 0.001	1.072	0.940–1.221	0.299
IPSS 6	1.434	1.301–1.58	< 0.001	1.004	0.867–1.162	0.961
IPSS 7	1.544	1.373–1.737	< 0.001	1.238	1.077–1.423	0.003

Only significant variables in univariate analysis are presented in this table. The variables included in this model were: age, height, weight, body mass index, hypertension, diabetes, depression, prostate disease, liver disease, smoking, alcohol consumption, education level, monthly income, marital status, circumcision, vasectomy, IPSS 1 (incomplete emptying), IPSS 2 (frequency), IPSS 3 (intermittency), IPSS 4 (urgency), IPSS 5 (weak stream), IPSS 6 (straining), and IPSS 7 (nocturia)

IIEF-5 international index of erectile function-5, *OR* odds ratio, *CI* confidence interval, *IPSS* international prostate symptom score

Table 4 Multivariate analysis for factors related to more than mild ED (IIEF-5 ≤ 17)

	Univariate			Multivariate		
	OR	95% CI	p Value	OR	95% CI	p Value
Age	1.040	1.026–1.055	< 0.001	1.017	1.001–1.034	0.033
BMI	1.062	1.006–1.122	0.030	1.031	0.971–1.094	0.316
Hypertension	2.331	1.611–3.375	< 0.001	1.289	0.837–1.985	0.250
Diabetes	4.039	2.590–6.298	< 0.001	2.637	1.594–4.364	< 0.001
Depression	2.958	1.623–5.391	< 0.001	2.269	1.182–4.357	0.014
Smoking (past or current)	1.767	1.250–2.500	0.001	1.465	1.019–2.107	0.039
Circumcision	0.583	0.424–0.801	0.001	0.689	0.489–0.973	0.034
IPSS 1	1.329	1.190–1.484	< 0.001	1.019	0.854–1.216	0.831
IPSS 3	1.272	1.133–1.428	< 0.001	0.834	0.679–1.023	0.081
IPSS 4	1.399	1.238–1.581	< 0.001	1.128	0.940–1.352	0.195
IPSS 5	1.426	1.285–1.583	< 0.001	1.267	1.058–1.518	0.010
IPSS 6	1.376	1.222–1.548	< 0.001	1.062	0.875–1.290	0.542
IPSS 7	1.389	1.200–1.607	< 0.001	1.157	0.960–1.394	0.127

Only significant variables in univariate analysis are presented in this table. The variables included in this model were: age, height, weight, body mass index, hypertension, diabetes, depression, prostate disease, liver disease, smoking, alcohol consumption, education level, monthly income, marital status, circumcision, vasectomy, IPSS 1 (incomplete emptying), IPSS 2 (frequency), IPSS 3 (intermittency), IPSS 4 (urgency), IPSS 5 (weak stream), IPSS 6 (straining), and IPSS 7 (nocturia)

IIEF-5 international index of erectile function-5, *OR* odds ratio, *CI* confidence interval, *BMI* body mass index, *IPSS* international prostate symptom score

(each IPSS score 4–5), hesitancy (OR 4.2), diminution of stream (OR 3.5), urgency (OR 2.3), dribbling (OR 2.2), and nocturia (OR 1.7) were risk factor for sexual dissatisfaction. That study used IPSS to evaluate LUTS. However, ED was not evaluated by the IIEF-5 or other validated questionnaires.

One study enrolled both a community-based population aged 40 years and over and clinic-attendees aged 45 years and over in 12 countries [10]. LUTS and ED were evaluated by the ICSmale questionnaires and ICSsex questionnaires. The relationship between LUTS and ED was more remarkable in the clinic sample than that in the community sample. In the clinic sample, sexual dysfunction was significantly related to many urinary symptoms. Among voiding symptoms, reduced stream (OR 2.39) was most strongly associated with sexual dysfunction. In general, storage symptoms, particularly incontinence (OR 1.92–2.83), showed the strongest and the most significant association with sexual dysfunction. However, the urinary flow rate was not associated with sexual symptoms.

A study involving health screening subjects also evaluated the relationship between each LUTS and ED [11]. The number of participants in each age group was 298 aged < 40 (14.2%), 799 aged 40–49 (38.3%), 719 aged 50–59 (34.5%), and 268 aged ≥ 60 (12.9%). That study used IPSS and IIEF-5, as in our study. Among seven IPSS items, only urgency (OR 1.75) and nocturia (OR 1.36) were significantly associated with the severity of ED. Elliott et al. [12] analyzed the relationship between the severity of LUTS and ED, and reported that only the voiding IPSS score was correlated with ED. However, the storage IPSS score was not after adjusted for age and comorbidities. In that study, a positive correlation was found between flow rate and IIEF-5 scores, indicating that patients with higher flow rates might have a better sexual function. However, this relationship was not statistically significant.

None of these studies performed multivariate analysis to compare the influence of each LUTS. To compare the influence and remove the effect of collinearity between each LUTS, variables in the multivariate model should include every significant LUTS item together. Although IPSS is a well-balanced questionnaire, each item is independent. It cannot be replaced by other items, although significant correlations exist between the items [18]. In this study, almost every IPSS score was related to ED. However, multivariate analysis with each LUTS variable in one model showed that only hesitancy and nocturia were related to mild ED, whereas only a weak stream was related to more than mild ED.

Possible mechanisms to explain the relationship between ED and LUTS include NOS/NO (nitric oxide synthase/ nitric oxide), the Rho-kinase activation pathways, autonomic hyperactivity, pelvic ischemia and microvascular dysfunction, inflammatory pathways, sex hormones, and psychological factors [1, 3, 19–22]. These common pathways were well summarized in a recent systemic review study [22]. After the development of phosphodiesterase-5 inhibitors (PDE5I), the role of NO in the prostate and penis has been intensively investigated. Several conditions, including aging, smoking, and metabolic syndrome, are known to reduce the function of nerves and endothelium in the penis, bladder, and prostate [2]. All these conditions can cause an imbalance in the NO/cGMP/PKG pathway and a decrease in NO bioavailability, resulting in LUTS and ED.

PDE5I is a first-line ED drug that has demonstrated efficacy as a monotherapy for LUTS [22]. A systemic review of 58 qualified studies concluded that treatment with PDE5I was associated with improvements in both LUTS and ED in men with significant problems in both areas [22]. Alphablockers, which are first-line treatments for LUTS, also exhibited a significant activity for ED when they were combined with PDE5I [7]. Furthermore, a recent meta-analysis showed a significant improvement in the maximal flow rate after the administration of alpha-blockers and PDE5I compared to alpha-blocker monotherapy, although PDE5I alone did not affect the flow rate or post-void residual urine volume [7]. In a meta-analysis including 12 studies, a comparison of PDE5I plus an alpha-blocker with an alpha-blocker alone demonstrated that the combination improved LUTS/ BPH assessed by IPSS, quality of life, maximal flow rate, and post-void residual urine volume more than alpha-blocker monotherapy [7]. Specifically, an increase in the maximal flow rate by combination therapy suggested that weak stream (IPSS 5) could be improved with ED treatment.

One interesting point of the present study was that circumcision showed a negative relationship with ED. Recently, the number of men who are circumcised has decreased. In our study, the proportion of men who underwent circumcision was significantly lower in the 2016 survey than that in the 2006 survey (71.9% vs. 54.7%, $p = 0.004$). The main cause of the decreased number of circumcisions might be due to public media information, relating that circumcision is unnecessary and could decrease sexual satisfaction. Although past studies have reported that circumcision can decrease penile sensitivity and negatively affect erectile function [23, 24], recent studies have shown that circumcision is not related to ED [25–27]. Some studies have even reported that circumcision had positive effects on sexual satisfaction [28, 29].

This study had several limitations. Although it was similar to the cohort study conducted with the same panel group registered with the same Internet survey company, there might be selection bias in the inclusion criteria. The low response rate and representativeness of the population are still major limitations of all Internet-based survey studies. Although the Proportionate Quota Sampling method was used to overcome the limitation of representativeness, it still

had limitations. Another limitation was the lack of clinical data, such as the maximal flow rate, prostate volume, and prostate-specific antigen value. In addition, although IPSS is a widely used validated questionnaire, there are no questions on specific LUTS, such as incontinence or dysuria. In this study, 62 (4.2%) of the men replied that they had prostate disease. Prostate disease could affect IPSS scores. In these surveys, the details of prostate disease (the type of prostatic disease, current or past, treatment history, etc.) were not investigated. This represents another main limitation of the study, although prostate disease was not a significant factor for ED in multivariate analysis. In addition, depression was not investigated by a validated tool, but by self-assessment. However, self-assessed depression was a significant factor for ED.

Conclusion

Almost every LUTS on the IPSS items was negatively correlated with erectile function. Among the LUTS, IPSS 5 (weak stream) was the only significant LUTS that was related to more than mild ED on multivariate analysis. Considering that PDE5I can improve the maximal flow rate, this might suggest that a weak stream is the symptom most closely related to ED and a significant symptom for predicting ED.

Compliance with ethical standards

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