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Original Article

Interstitial Cystitis/Painful Bladder Syndrome: Prevalence Estimates, Quality of Life and Depression among Older Adult Korean Women

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한국 여성노인의 간질성방광염의 유병률, 삶의 질, 우울 연구

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Abstract

Interstitial Cystitis/Painful Bladder Syndrome: Prevalence Estimates, Quality of Life and Depression among Older Adult Korean Women. What is already known about the topic? 1) Interstitial Cystitis/Painful bladder syndrome (IC/PBS) is a chronic, painful, inflammatory condition of the bladder wall. 2) Previous studies examining the prevalence and impact were focused on middle life women and not elderly women. 3) Epidemiologic studies of IC/PBS have been predominantly conducted in Western countries and little research reported in Asian countries.

Key Words : Cystitis, Interstitial, Aged, Women, Prevalence, Quality of life, Depression

INTRODUCTION

Age-related changes in bladder function have been described by many researchers. Interstitial cystitis (IC)/painful bladder syndrome (IC/PBS), overactive bladder, and urinary incontinence are more commonly found in women than as compared to men (Shiroky, 2004). IC/PBS is a chronic, painful, inflammatory condition of the bladder wall (Evans & Sant, 2007). In 2002 the International Continence Society (ICS) established IC/PBS as a clinical syndrome.

IC is most prevalent in midlife women, however, it is also commonly reported by women 60~69 years old (Ito, Ueda, Honma, & Takei, 2007; Temml et al., 2007) and the prevalence of moderate/severe IC symptoms was highest in the oldest age group (Temml et al., 2007). In the literature the terms IC, PBS, and IC/PBS are often used interchangeably suggesting that actual number of patients suffering from urinary tract pain syndromes may go under reported (Michael, Kawachi, Stampfer, Colditz, & Curhan, 2000).

Epidemiologic studies of IC/PBS have been predominantly conducted in Western countries. Investigators in the U. S., Canada, and Austria report a prevalence rate of

주요어 : 간질성 방광염, 여성노인, 유병률, 삶의 질, 우울

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7.9% to 43.2% (Nickel, Teichman, Gergoire, Clark, & Downey, 2005; Temml et al., 2007). In a sample of American women, Rosenberg et al found that 17.5% of 2043 women (age 18~92 yr) (Rosenberg, Page, & Hazzard, 2007b). In contrast to studies of western women, a Japanese study found the prevalence of IC/PBS to be lower, i.e., 4.5 patients per 100,000 women (Ito, Miki, & Yamada, 2000). Whether this lower prevalence of IC/PBS is common to other Asian countries is not known. It needs to be studied that Korean women are more like Japanese or western women in the prevalence of IC/PBS.

Due to the symptoms associated with IC/PBS, women with this condition often report reductions in physical function, increases in psychological distress, and decreases in quality of life (QOL) (Arnold et al., 2004). Through some reports, patients with IC have decreased functioning in various areas, including difficulty performing normal activity due to physical limitations, less energy, and poor social functioning (Michael et al, 2000); poor quality of life and depression (Rothrock, Lutgendorf, Hoffman, & Kreder, 2002). Another study reported the degree of limitation in psychosocial and physical functioning was associated with symptom severity (Michael et al., 2000).

The impact of IC/PBS on daily functioning may be greatest in elderly women, but this remains to be studied and determined. Also there was rarely reported about the prevalence of IC/PBS and its impact of quality of life and depression using a sample of elderly women. Especially it was rarely reported about the prevalence of IC/PBS and its adverse effects related with symptoms of IC/PBS in Korea.

Using a sample of older adult Korean women, the current study aimed to estimate the prevalence of IC/PBS symptoms, severity and risk for IC; to determine the relationships among IC/PBS and general characteristics, depression, and QOL; and to compare women with symptoms of IC/PBS to those without symptoms on general characteristics, depression, and QOL scores.

METHODS

1. Study Design

A descriptive co-relational design was used to estimate the prevalence of IC/PBS symptoms and describe the relationships among symptoms, general sample characteristics, depression and QOL in older Korean women.

2. Participants

Women were recruited via postings on bulletin board at 3 elderly welfare centers in the metropolitan area of Seoul, Korea. Women who were 60 years of age and older and living in the community were invited to participate in the study. Data were collected from May 1 to June 30, 2007. The study was approved by Institutional Research Ethics Board in university. After the informed consent was explained, written informed consent was obtained. The interviews were conducted by two researchers and five research assistants. The interviews took approximately 30 minutes.

3. Measurements

1) IC/ PBS Symptom Measures

The English version of Interstitial Cystitis Symptom Index/ Interstitial Cystitis Problem Index (ICSI/ICPI; O'Leary, Sant, Fowler, Whitmore, & Spolarich-Kroll, 1997) was tested their reliability and validity by other researchers (Kushner, & Moldwin, 2006; Sirinian, Azevedo, & Payne, 2005; Lubeck, Whitmore, Sant, Alvares-Horine, & Lai, 2001). The participants were asked for about their symptoms during the past month (ICSI) and the problems arising from each of these four symptoms (ICPI). The ICSI/ICPI scores were summed from scores on the 4 questions respectively. The total ICSI score ranges from 0 to 20 and ICPI score from 0 to 16. Reliability of the Korean version of ICSI/ICPI (ICSI/ICPI-K) used here Cronbach's α=.830.

2) Psychological distress: Korean Geriatric Depression Scale (KGDS)

The Korean version of S-Geriatric Depression Scale (KGDS) was used. Its original version is Short form GDS (Yesavage, Brink, et al., 1983). KGDS is composed of 15 items, the same items as developed (Choi, Chae, Kim, & Jeon, 2004). Scores of 5, 9, and 12 were used to classify patients as mildly, moderately, and severely depressed, respectively. In this research, its reliability was Cronbach's α=.772.

3) Health-related Quality of Life (HRQOL): the King's Health Questionnaire (KHQ)

The KHQ is a disease-specific health-related QOL (HRQOL) instrument developed by Kelleher et al (Kelleher, Cardozo, Khullar, & Salvatore, 1997). It consists of two single-item questions to address life interference and life satisfaction, and seven multi-item domains. The seven multi-item domains include role limitations, physical and social limitations, personal relationships, emotions, sleep and energy (Homma & Uemura, 2004). The KHQ was validated linguistically in the Korean language (Oh, Park, Paick, Park, & Choo, 2005) and formalized (Oh & Ku, 2007). Higher scores on KHQ indicate more limitations. In this study, internal consistency reliability was Cronbach's α=.934.

4. Analysis

SPSS/WIN 15.0 program was used to do statistical analysis. The prevalence and urologic characteristics were analyzed by frequency, mean, and severity. Correlations among demographic characteristics, ICSI-K and ICPI-K, KGDS, and KHQ were analyzed by Pearson correlation. Group differences in variables by ICSI-K cut-off score≥5 were analyzed by ANOVA.

RESULTS

1. General demographic characteristics

The demographic characteristics of the women are shown in Table 1. The women were on average 74.3 years old, and widowed (87%).With regard to health habits, 30% reported engaging in sports and 50% had sleeping difficulties. Sixty percent of the women reported that they experienced depression with most rating it as 'mild'. The most commonly reported medical condition was hypertension.

The mean scores for the King's Health Questionnaire (KHQ) were 15.42 (7.34), which including physical and social limitations 5.22 (2.38), psychological emotions 4.05 (2.08), sleep and energy 3.06 (1.73), role limitation of daily activities 2.65 (1.29), and personal relationships 0.58 (1.44) in details.

Table 1. General characteristics of the Korean elderly women (N=298)

Variables	n (%) or M±SD
Age (year)	74.3±6.20
Body mass index (BMI) (kg/m^2)	23.7±3.97
Marital status	
Widowed	259 (86.9)
Have husband	39 (13.1)
General health perception (1~5)	3.21±0.87
Very good (1)	10 (3.4)
Good (2)	51 (17.1)
Moderate (3)	130 (43.6)
Bad (4)	90 (30.2)
Very bad (5)	17 (5.7)
Healthy habits (1~7)	4.40±1.37*
Sleep for 7~8 hours	150 (50.3)
Having a breakfast	265 (88.9)
Not having a snack	205 (68.8)
Care to have a little salt	162 (54.4)
Not smoking	277 (93.0)
Taking a walk	181 (60.7)
Doing sports	86 (28.9)
Medical condition	0.84±0.92*
Hypertension	142 (47.7)
Diabetes mellitus	38 (12.8)
Cardiac disease	30 (10.1)
Vaginitis	18 (6.0)
Stroke	16 (5.4)
Cervix cancer	7 (2.3)
Geriatric depression scale (KGDS)	5.98±3.60
No depression	117 (39.3)
Mild depression (≥5)	102 (34.2)
Moderate depression (≥9)	71 (23.8)
Severe depression (≥12)	8 (2.7)
King's health questionnaire (KHQ)	15.42±7.34

*The mean for the number responded.

2. Prevalence of IC / PBS symptoms, severity and the risk for IC

Overall the prevalence rate of IC was 43.6% (130 women) using a cut-off of 5 the score on the ICSI. However, when a more rigorous score of 7 was used, the prevalence rate decreased to 16.2%. The prevalence of mild to severe IC symptoms using ICSI-K was 54%. The percentage at risk for IC using summed scores of ICSI-K and ICPI-K) was 43.6% (Table 2).

Table 2. Prevalence, severity & risk for ICSI/ICPI-K among older Korean women (N=298)

Items	Criteria	n (%)
Criteria for IC by O'Leary[a] Clemons[b]		
Diagnosed as IC[a,b]	≥5	130 (43.6)
Mild symptom[b]	<5	145 (48.7)
Using ICSI-K score symptom severity[c]		
None	0~3	137 (46.0)
Mild	4~6	77 (25.8)
Moderate	7~11	63 (21.1)
Severe	12~20	21 (7.1)
Using ICSI+ICPI-K score, risk for IC[c]		
No risk	0~6	168 (56.4)
Minimal risk	7~13	90 (30.2)
Moderate risk	14~23	32 (10.7)
High risk	24~36	8 (2.7)

IC=interstitial cystitis; ICSI/ICPI-K=interstitial cystitis symptom index/ interstitial cystitis problem index-Korean version.

[a]O'Leary, M., Sant, G., Fowler, F. J., Whitmore, K., & Spolarich-Kroll, J. (1997). The interstitial cystitis symptom index and problem index. *Urology, 49*, 58-63.

[b]Clemons, J. L., Arya, L. A., & Myers, D. L. (2002). Diagnosing interstitial cystitis in women with chronic pelvic pain. *Obstet Gynecol 100*, 337-341.

[c]Temml, C., Wehrberger, C., Riedl, C., Ponholzer, A., Marszalek, M., & Madersbacher, S. (2007). Prevalence and correlates for interstitial cystitis symptoms in women participating in a health screening project. *Eur Urol, 5*(3), 803-809.

3. Relationships of ICSI-K and ICPI-K to general characteristics

The ICSI-K score was positively related to age, general health perception and co-morbidity. And the ICPI-K score was positively related to health perception and

co-morbidity. However BMI (body mass index) and healthy habits were not significantly related to both of ICSI-K and ICPI-K (Table 3).

Table 3. Relationships of ICSI-K and ICPI-K to general characteristics

Variables	Age	BMI	Health perception	Healthy habits	Co-morbidity
ICSI-K	.133*	-.017	.235***	-.036	.186**
ICPI-K	.097	-.077	.275***	-.067	.133*

BMI=body mass index; ICSI-K=interstitial cystitis symptom index-Korean version; ICPI-K=interstitial cystitis problem index-Korean version.
*p<.05, ** p<.01 *** p<.001

4. Relationships of ICSI-K and ICPI-K to KGDS and KHQ

The ICSI-K scores had moderate correlations with KHQ and had mild correlations with KGDS; The ICPI had strong positive correlations with KHQ and had mild correlations with KGDS. KHQ scores had mild positive correlation with KGDS. As shown in Table 4, the higher the IC symptom score and the higher IC problem score, higher the KHQ scores.

Table 4. Bivariate correlations among ICSI-K, ICPI-K, KGDS and KHQ

Variables	ICSI-K	ICPI-K	KGDS
ICPI-K	.674*		
KGDS	.294*	.376*	
KHQ	.428*	.626*	.331*

ICSI-K=interstitial cystitis symptom index-Korean version; ICPI-K= interstitial cystitis problem index-Korean version; KGDS=Korean version of geriatric depression symptoms; KHQ=king's health questionnaire.
*p<.01.

5. Differences in variable by ICSI severity cut-off score

Based on the cut-off score 5 on the ICSI-K, age, BMI, general health perception, healthy habits, co-morbidity, KGDS scores, and KHQ scores were compared by independent sample tests. KHQ scores were significantly higher in women with symptoms of IC/PBS as compared to those without symptoms (F=44.3, p<.0001). Both depression and BMI tended to be greater in women with IC/PBS as compared to those without symptoms (F=3.819, p=.052; F=2.945, p=.087, respectively). However, no other group differences were found in age, general health perception, health habits and co-morbidity (Table 5).

Table 5. Differences by ICSI-K cut-off score

Variables	ICSI-K score	M±SD	F	p
Age	≥5	74.61±6.24	0.060	.807
	<5	73.94±6.26		
BMI	≥5	23.59±4.98	2.945	.087
	<5	23.77±2.95		
General health perception	≥5	3.42±0.77	0.033	.856
	<5	3.04±0.90		
Healthy habits	≥5	4.26±1.31	2.545	.112
	<5	4.52±1.47		
Co-morbidity	≥5	1.02±1.03	1.063	.303
	<5	0.71±0.80		
KGDS	≥5	6.82±3.80	3.819	.052
	<5	5.34±3.27		
KHQ	≥5	18.54±8.29	44.27	.000
	<5	13.11±5.63		

BMI=body mass index; ICSI-K=interstitial cystitis symptom index-Korean version; KGDS=Korean version of geriatric depression symptoms; KHQ=king's health questionnaire.

DISCUSSION

In the current study using the ICSI-K and a cut-off score of 5, we found the prevalence of IC in older Korean women to be 43.6%. Using a more rigorous score of 7, the prevalence rate was 16.2%. Thus, the prevalence IC/PBS in this sample of older Korean women is similar to that observed in Western samples (Temml et al., 2007). Using a similar cut-off level, studies conducted in Australia, Europe, and the U. S. have found rates of 7.9% to 43% (Nickel et al, 2005; Temml et al., 2007), while a study performed in Japan found only 4.5 patients per 100,000 women with IC/PBS. However, the prevalence of IC in a subgroup of older Japanese women is similar to that found in the current study (Ito et al., 2007; Ito et al., 2000; Temml et al., 2007).

The current study also demonstrates that the prevalence rate of IC in older Korean women depends on the cut-off score used. The prevalence rate in this study was higher than in a study of American women which used an ICSI score of 5, but lower than a study in which 4 was used as the cut-off point (Clemons, Arya, & Myers, 2002). It remains to be determined whether a cut-off score of 4 or 5 rather than 7 would be more clinically useful in detecting IC/PBS and ultimately its prevention and management. Clemons et al (2002) using a score of 5 or more on the ICSI had a sensitivity of 94%, a positive predictive value of 53%, and a negative predictive value of 93%, using a receiver operator characteristic curve. Thus, additional work is needed particularly in older

populations to develop a clinically useful tool to determine those at risk for a diagnosis of IC/PBS.

Understanding the presenting symptoms of urinary frequency, urinary urgency, and pelvic pain in the presence of otherwise normal physical findings can enhance the primary care providers' ability to appropriately identify the disease. Early identification may allow initiation of therapy or referral before the problem becomes refractory to standard treatment (Rosenburg, Newman, & Page, 2007a).

The current study also shows that IC/PBS is associated with a number of challenging symptoms including voiding at night, frequent voiding in the day time, urgency, and pelvic pain in older Korean women. Nocturnal enuresis was the most frequent symptom reported as 83.3% in this sample. This percentage is similar to 83.4% found with a sample of Austrian women over the age of 60 (Temml et al., 2007) but higher than that found in Japanese (72.2%; Ito et al., 2007) or Taiwanese samples (46.9% (Lin, Ng, Chen, Hu, & Chen, 2004). Nocturnal enuresis results in sleep disturbances which has been linked to depression (Rothrock et al., 2002). Management of nocturnal enuresis as well as other symptoms of IC/PBS may be an important step towards improving overall QOL in older women.

Women with IC/PBS also report other medically unexplained urologic symptoms including overactive bladder syndrome (OBS) (Buffington, 2004). In the current study, symptoms of IC/PBS were found to be associated with physical interference, psychological distress, and lower QOL in Korean women similar to that noted in western women (Arnold et al., 2004; Michael et al., 2000). This constellation of symptoms and their disruption in normal sleep may contribute to the reduced QOL noted in this sample of women.

A limitation of the current study is that no biomarker for IC/PBS was used, but tools such as the ICSI/ICPI may serve as an initial screening measure to evaluate the prevalence of IC/PBS and related psychological distress symptoms. Another limitation of the current study is that the sample was self-referred for participation. Indeed a higher prevalence of women with IC/PBS may have been found if the participants had been recruited from a clinic population.

Conclusion

In conclusion, we found that almost half of older Korean women in this sample had IC/PBS symptoms using IC/PBS cut-off score of 5 and this rate was similar to that noted in Western women. Interstitial cystitis symptoms and problems impacted limitation in life highly. Therefore we suggest it needs to be developed therapeutic intervention for older Korean women with IC/PBS symptoms. This study will be an important bridge in IC/PBS issues and contribute the development of program for elderly women with IC/PBS symptoms.

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