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EPIDEMIOLOGIC COHORT STUDY OF INTERSTITIAL CYSTITIS / BLADDER PAIN SYNDROME AND HYSTERECTOMY: THE CONFOUNDING EFFECT OF COMORBIDITIES

Hypothesis / aims of study
The diagnosis of interstitial cystitis/bladder pain syndrome (IC/BPS) can be elusive and often confused with gynecological conditions. The difficulty of accurately identifying IC/BPS may result in unnecessary hysterectomies, especially when confounded by comorbidity. Clinicians have noted that large proportions of patients with IC/BPS had a history of hysterectomy [3]. We investigated the causal effect of IC/BPS on hysterectomy and the confounding effect of comorbidities in a large nationwide cohort study.

Study design, materials and methods
This retrospective cohort study searched the national insurance database for those patients with a new diagnosis of IC/BPS from 2002 through 2013. After limiting our sample to women with a diagnosis of IC/BPS, we identified the IC/BPS cohort. Women with a history of hysterectomy before IC/BPS diagnosis were excluded. Women with IC/BPS were matched 1:1 with women without IC/BPS by propensity scoring using confounding factors, including age and five comorbidities (leiomyoma, adenomyosis, endometriosis, pelvic organ prolapse, pelvic pain). Univariate and multivariate analysis of the association between IC/BPS and hysterectomy were compared in these two cohorts.

Results
A total of 3008 women, divided into two cohorts, were identified. According to univariate analysis with the chi-square test, the association between IC/BPS and hysterectomy was found to be significant (P=0.000). However, according to multivariate analysis controlling for age and five comorbidities, the hazard ratio (HR) of hysterectomy in the non-IC/BPS cohort compared with the IC/BPS cohort was 1.518 (95% CI= 0.948-2.432, p=0.083), which was not significant.

Interpretation of results
From the LHID2010 data, our cohort study revealed that IC/BPS is not a risk factor for hysterectomy. Multivariate analysis with comorbidities as confounding factors should be utilized to confirm the results, which may have been influenced by univariate analysis.

Concluding message
IC/BPS was not a risk factor of hysterectomy when considering the confounding effect of comorbidity.

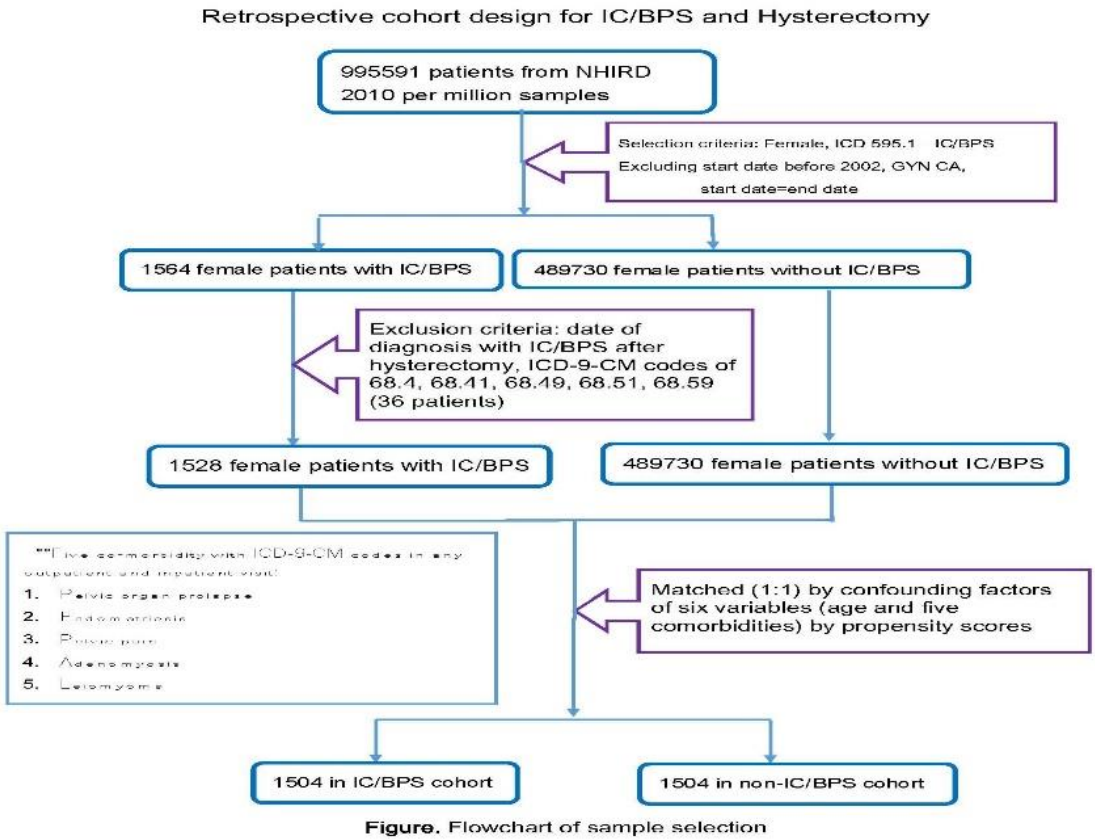

Figure. Flowchart of sample selection

Table 1. Demographic characteristics of patients in the IC/BPS cohort and non-IC/BPS cohort (n=3008)

variable	IC/BPS cohort (n=1504)	non-IC/BPS cohort(n=1504)	*P*
Age (y/o) Mean (range)	47.82 ± 16.25 (3.39-97.95)	47.25 ± 16.82 (0.11-98.04)	0.344
Leiomyoma Mean physician visits (range)	1.31 ± 4.28 (0-67)	1.18 ± 3.59 (0-51)	0.394
Adenomyosis Mean physician visits (range)	0.47 ± 3.09 (0-76)	0.39 ± 2.09 (0-30)	0.372
Endometriosis Mean physician visits (range)	0.52 ± 6.23 (0-214)	0.34 ± 2.17 (0-51)	0.277
Pelvic organ prolapse Mean physician visits (range)	0.26 ± 1.67 (0-39)	0.26 ± 1.69 (0-39)	0.965
Pelvic pain Mean physician visits (range)	0.10 ± 0.92 (0-27)	0.09 ± 0.87 (0-28)	0.807

Mean physician visits = (Total number of outpatient visits + Total number of admissions) / Total patient number

Table 2. Univariate analysis (chi-square) of the association between IC/BPS and hysterectomy

variable	Hysterectomy (n, %)		*Chi-Square*	*P*
	no	yes		
IC/BPS				
No (n=1504)	1434 (95.3%)	70 (4.7%)	18.606	0.000*
Yes (n=1504)	1476 (98.1%)	28 (1.9%)		

** indicates P<0.05*

Table 3. Univariate analysis (logistic regression) of the association between confounding factors and hysterectomy

Variable (physician visits)	*Wald*	*p*
age	1.955	0.162
Leiomyoma	50.141	0.000*
Adenomyosis	40.925	0.000*
Endometriosis	4.445	0.035*
Pelvic organ prolapse	14.041	0.000*
Pelvic pain	0.046	0.830

*Physician visits = Number of outpatient visits or admissions, * indicates P<0.05*

Table 4. Hazard ratio (HR) of hysterectomy in the non-IC/BPS cohort compared with the IC/BPS cohort (n=3008)

	non-IC/BPS cohort vs. IC/BPS cohort, *HR(95%CI)*	*p*
IC/BPS(no/yes)	1.518 (0.948-2.432)	0.083
age	0.994 (0.981-1.007)	0.357
Leiomyoma Per physician visit	1.065 (1.047-1.083)	0.000*
Adenomyosis Per physician visit	1.056 (1.038-1.075)	0.000*
Endometriosis Per physician visit	1.011 (0.997-1.026)	0.127
Pelvic organ prolapse Per physician visit	1.062 (1.024-1.102)	0.001*
Pelvic pain Per physician visit	0.981 (0.746-1.290)	0.891

Adjusted confounders: age, physician visit for leiomyoma, adenomyosis, endometriosis, pelvic organ prolapse, pelvic pain; HR=Hazard ratio; Physician visit = Number of outpatient visits or admissions;

** indicates P<0.05*

Disclosures

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