Consequences of Interstitial Cystitis/Bladder Pain Symptoms on Women's Work Participation and Income: Results from a National Household Sample

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Purpose: We describe differences in work participation and income by bladder symptom impact and comorbidities among women with interstitial cystitis/bladder pain syndrome.

Materials and Methods: Cross-sectional data from 2,767 respondents younger than 65 years identified with interstitial cystitis/bladder pain syndrome symptoms were analyzed. The data were taken from the RAND Interstitial Cystitis Epidemiology (RICE) survey, and included retrospective self-reports of interstitial cystitis/bladder pain syndrome impact, severity, years since onset, related comorbidities (depressive symptomatology, number of conditions), work participation and income, and personal characteristics. Multiple regressions predicted 5 current work outcomes of works now, kept from working by pain, missed work days, days worked when bothered by symptoms and real income change since symptom onset.

Results: Controlling for work status at symptom onset and personal characteristics, greater bladder symptom impact predicted a greater likelihood of not now working, kept more days from working by pain, missed more work days and working more days with symptoms. More depressive symptomatology and greater number of comorbidities predicted reduced work participation. Women experienced no growth in real income since symptom onset. Measures of symptom severity were not associated with any of the economic outcomes.

Conclusions: Greater interstitial cystitis/bladder pain syndrome symptom impact, depressive symptomatology and count of comorbidities (but not symptom severity) were each associated with less work participation and leveling of women's long-term earnings. Management of bladder symptom impact on nonwork related activities and depressive symptomatology may improve women's work outcomes.

Key Words: cystitis, interstitial; urinary bladder; pelvic pain; sampling studies; employment

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CHRONIC pain syndromes have economic costs. Prior research documents that the direct medical costs for women seeking treatment for interstitial cystitis/bladder pain syndrome are twice those for women not diagnosed with IC/BPS.[1,2] Prior studies also establish high economic costs through work loss during the first year after diagnosis.[1–3]

Prior research provides an incomplete picture of the economic burden

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to women themselves for 2 reasons. 1) The focus on tertiary care clinical samples fails to represent the potentially larger number of women with undiagnosed and untreated IC/BPS symptoms.[4,5] 2) Prior studies did not collect information on work measures before onset, so they are unable to estimate the longer term economic costs.

Population based data with information collected about current and past health and working status and earnings from the RICE survey were used to estimate the relationship between IC/BPS health related measures and changes in women's work participation and income. The study describes consequences to work participation and income associated with the burden of IC/BPS, and the improvements in these outcomes that might be achieved with improved clinical and psychosocial management of IC/BPS related pain symptoms as well as the reduction in impact on quality of life and comorbidities.

METHODS

Study Design

As described elsewhere the RICE study first screened 146,231 households across the United States by telephone survey in 2007 to 2009.[6] In each household identified as having 1 or more women with IC/BPS symptoms, 1 woman was interviewed. The percent of women currently working decreased markedly between age 64 and 65 years at the time of the interview (2,767) so we restricted the sample to women younger than 65 years. Population weights derived from screening data were applied. All predictor and outcome measures were self-reported.

Predictors

Sociodemographic predictor variables were age, race/ethnicity, education, current marital status, living arrangements and number of lifetime births. Method of remuneration reflects working conditions.[7] Hourly vs nonhourly wages are a predictor of working part time and part year, working in a blue collar occupation and working fewer hours per week. Analyses included a control variable for the units in which earnings were reported (hourly, weekly, monthly or annually).

Six IC/BPS related health measures were considered. The RAND BSI-6 (Bladder Symptom Impact scale) measures the impact of bladder symptoms on quality of life across the 6 areas of interest in life, energy level, moods, feelings of self-worth, social life and ability to carry out home responsibilities ($\alpha = 0.90$ in full RICE sample).[8] A higher score indicates a greater impact on quality of life. The 2 IC/BPS symptom severity measures considered were the ICSI (Interstitial Cystitis Symptom Index, $\alpha = 0.85$[9]) and ICPI (Interstitial Cystitis Problem Index, $\alpha = 0.90$[9]), which assess the presence and degree of IC/BPS symptoms and their associated distress, respectively.[9] Additional measures included years since symptom onset, depressive symptomatology and count of comorbidities. Number of years since onset was calculated from currently reported age and year and age at onset.

Depressive symptomatology was derived from the PHQ-8 (Patient Health Questionnaire 8-item) scale ($\alpha = 0.83$),[10] with a higher score indicating more depressive symptoms.[10] The number of chronic conditions the respondents self-reported as having ever been diagnosed with were summed (table 1).

Outcomes

Current work status was determined by the response to the question, "In the past month, were you working for pay at all?" Women who were not currently working were asked if they were kept from working by bladder problems or pelvic pain. Women currently working were asked the number of work days missed in the last month because of bladder problems or pelvic pain and the number of days worked in the last month when bothered a great deal by symptoms. Women who worked for pay were asked about the number of hours worked per week and earnings. All earnings were annualized and converted to 2008 dollars.[11] Earnings were bottom-coded so that earnings less than 50% of the U.S. Department of Health and Human Services federal poverty level were set to 50% ($5,200 in 2008). Bottom-coding was used when values below that threshold might be unduly influenced by outliers.[12] An ordered measure of change in income ratio of current-to-initial earnings with 5 levels was constructed (table 2).

Imputation

Rates of missingness were low (less than 8%). Cases missing employment status and earnings when symptoms

Table 1. *Sociodemographic characteristics by work status at symptom onset*

	All Respondents		Working		Not Working	
No. pts	2,767		1,637		1,121	
Mean (SE) age at interview (range 18-64)	42	(0.31)	43	(0.39)	40	(0.49)*
% Race/ethnicity:						
White	72.5		72.5		72.5	
Black	10.8		11.3		10.1	
Hispanic	11.7		11.6		11.7	
Other	4.9		4.5		5.4	
% Education:†						
No college	35.6		33.6		38.5	
Some college	35.7		35.5		38.9	
College+	28.7		30.9		25.6	
% Lives alone	9.3		9.4		9.0	
% Currently married	65.0		65.7		63.9	
Mean (SE) births (range 0-5)	2.0 (0.03)		2.0 (0.04)		2.1 (0.06)	
Mean (SE) BSI-6 (range 0-7)	1.7 (0.04)		1.7 (0.05)		1.8 (0.06)	
Mean (SE) yrs since symptom onset (range 1-60)	13	(0.25)	11	(0.26)	16	(0.45)*
Mean (SE) raw PHQ-8 (range 0-24)	8.0 (0.14)		7.6 (0.18)		8.5 (0.22)‡	
Mean (SE) comorbidities (range 0-9)§	1.5 (0.04)		1.5 (0.05)		1.6 (0.06)	

Missing 8 patients with missing work status at onset.
All percents and means are weighted.
* p <0.001.
† p <0.05 for test of difference from women who worked at symptom onset.
‡ p <0.01.
§ Comorbidities are fibromyalgia, chronic fatigue syndrome or Epstein-Barr syndrome, irritable bowel syndrome or spastic colon, chronic sinusitis, chronic migraine, heart disease or heart attacks, chronic lung disease/emphysema, diabetes, cancer other than skin cancer or bladder cancer, arthritis or rheumatism, vulvodynia or vulvar vestibulitis and overactive bladder.