The Prevalence and Overlap of Interstitial Cystitis/Bladder Pain Syndrome and Chronic Prostatitis/Chronic Pelvic Pain Syndrome in Men: Results of the RAND Interstitial Cystitis Epidemiology Male Study

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Purpose: As part of the RICE (RAND Interstitial Cystitis Epidemiology) study, we developed validated case definitions to identify interstitial cystitis/bladder pain syndrome in women and chronic prostatitis/chronic pelvic pain syndrome in men. Using population based screening methods, we applied these case definitions to determine the prevalence of these conditions in men.

Materials and Methods: A total of 6,072 households were contacted by telephone to screen for men who had symptoms of interstitial cystitis/bladder pain syndrome or chronic prostatitis/chronic pelvic pain syndrome. An initial 296 men screened positive, of whom 149 met the inclusionary criteria and completed the telephone interview. For interstitial cystitis/bladder pain syndrome 2 case definitions were applied (1 with high sensitivity and 1 with high specificity), while for chronic prostatitis/chronic pelvic pain syndrome a single case definition (with high sensitivity and specificity) was used. These case definitions were used to classify subjects into groups based on diagnosis.

Results: The interstitial cystitis/bladder pain syndrome weighted prevalence estimates for the high sensitivity and high specificity definitions were 4.2% (3.1–5.3) and 1.9% (1.1–2.7), respectively. The chronic prostatitis/chronic pelvic pain syndrome weighted prevalence estimate was 1.8% (0.9–2.7). These values equate to 1,986,972 (95% CI 966,042–2,996,924) men with chronic prostatitis/chronic pelvic pain syndrome and 2,107,727 (95% CI 1,240,485–2,974,969) men with the high specificity definition of interstitial cystitis/bladder pain syndrome in the United States. The overlap between men who met the high specificity interstitial cystitis/bladder pain syndrome case definition or the chronic prostatitis/chronic pelvic pain syndrome case definition was 17%.

Conclusions: Symptoms of interstitial cystitis/bladder pain syndrome and chronic prostatitis/chronic pelvic pain syndrome are widespread among men in the United States. The prevalence of interstitial cystitis/bladder pain syndrome symptoms in men approaches that in women, suggesting that this condition may be underdiagnosed in the male population.

Key Words: cystitis, interstitial; prostatitis; epidemiology; men

Abbreviations and Acronyms

CP/CPPS = chronic prostatitis/chronic pelvic pain syndrome

CPS = Current Population Survey

IC/BPS = interstitial cystitis/bladder pain syndrome

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PREVIOUS studies have estimated the prevalence of interstitial cystitis/bladder pain syndrome and chronic prostatitis/chronic pelvic pain syndrome in men using various methods. Most of these studies are limited by the

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lack of validated case definitions for these disorders and/or their use of study samples from limited geographic regions.[1] As a result, to our knowledge there are no comprehensive, national, weighted prevalence estimates of IC/BPS and CP/CPPS in men in the current literature.

To address this knowledge gap, we performed a national population based screening to identify men with symptoms or a diagnosis of IC/BPS or CP/CPPS. We then applied previously validated case definitions of IC/BPS and CP/CPPS to these conditions in men to obtain more comprehensive and accurate prevalence estimates.

MATERIALS AND METHODS

IC/BPS Case Definitions

Our group previously developed and validated high sensitivity and high specificity case definitions for IC/BPS in women.[2] For the present study we modified these case definitions for use in men by removing female specific exclusion criteria (cervical cancer, uterine cancer, pregnancy), and replacing them with male exclusion criterion (prostate cancer), while preserving all general exclusion criteria (bladder cancer, colon cancer, prior pelvic radiation, spinal cord injury etc). We also modified the RICE high sensitivity case definition by removing the criteria related to hormone injection therapy for endometriosis. The male IC/BPS case definitions can be found on the RAND website at http://www.rand.org/pubs/working_papers/WR959.html.

CP/CPPS Case Definition

We used a case definition for CP/CPPS derived from the NIH-CPSI (National Institutes of Health Chronic Prostatitis Symptom Index).[3] This definition requires the presence of perineal or ejaculatory pain plus a score of 4 or greater on the NIH-CPSI pain subscale. The sensitivity and specificity of this case definition were 70% and 91% compared to patients with benign prostatic hyperplasia, and the specificity was 99% compared to controls.[4]

Population Screening

Population based screening was performed by ORC (Opinion Research Corp.) between February and March 2010. ORC conducts a twice weekly omnibus survey wherein data on a wide variety of subjects are collected. These surveys were conducted on a national level of randomly sampled households using random digit dialing. For the purposes of this project, 2 additional items were inserted into these interviews. "1. Is there a male age 18 or over in this household who has ever had problems with pain, pressure or discomfort in the pelvic or bladder area? The pain may or may not make him feel like he needs to urinate frequently. 2. Have you or another man age 18 or over currently living in this household ever been told by a doctor that you or they have CHRONIC PROSTATITIS or INTERSTITIAL CYSTITIS?" These items were addressed to the household member who answered the telephone. If an eligible man in the household was identified, the household member was asked whether he or she would give permission for RAND to contact this man about the study.

Next, RAND scheduled telephone interviews with the consenting men. If more than 1 man in the household met the screening criteria, the man with the most recent birthday was selected. The screener then presented a series of additional questions based on exclusionary and inclusionary criteria for both conditions. If the respondent screened positive based on these criteria, he was asked to complete a more in-depth interview lasting approximately 1 hour. The full interview contained questions on respondent current and past symptoms related to IC/BPS and CP/CPPS, medical history, insurance coverage, work status and other demographic items.

Statistical Analysis

Nonresponse weights. Nonresponse weights are the inverse of predicted probabilities from a multivariate logistic regression model that predicted whether screening occurred among households with at least 1 male with bladder symptoms and/or a CP/CPPS or IC/BPS diagnosis. Predictors of screening were respondent gender, age, race/ethnicity, education level, employment status, marital status, total household income, head of household status, condition status (diagnosis only, symptoms only or both), homeowner status, and indicators the household had children younger than age 6 years, ages 6 to 11 and ages 12 to 17. Within the logistic regression models, predictors were missing at low rates, and simple imputation was performed for missing values for household income (median) and the number of children (mean).

Overall weights. The final weight for each of the screened cases was calculated by multiplying the ORC weight by the nonresponse (screening) weight. Because there was no screening based exclusion of households that did not screen positive, those observations received a nonresponse weight of 1.

Prevalence estimates. CPS estimates from 2006 were used to estimate the number of males age 18 years or older per household. Data were aggregated by household ID and the total number of males age 18 or older was calculated. Households without any males age 18 or older were dropped and the average number of males per household was calculated using the CPS weights. Prevalence estimates were calculated by dividing the household level estimate by the CPS based mean number of males per household. These estimates were based on 2006 census data for men 18 years old or older.[5]

RESULTS

ORC screened 6,072 households, of which 29 refused to answer the screening question and 794 had no adult male residents. The remaining 5,249 households were asked the 2 screening questions. Of these households 788 screened positive, with 421 having respondents with symptoms, 341 having someone else in the household with symptoms, and 26 households having both the respondent and someone else with symptoms. Of the remaining households 3,995