

## Bladder Base Tenderness in the Etiology of Deep Dyspareunia

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### ABSTRACT

**Introduction.** Bladder base tenderness can be present on pelvic exam in women with pelvic pain. However, its exact prevalence and clinical implications are not well understood.

**Aim.** The aim of this study was to determine whether bladder base tenderness is associated with specific symptoms or signs in women, particularly dyspareunia.

**Methods.** Retrospective review of 189 consecutive women seen by a gynecologist in 2012 at a tertiary referral center for pelvic pain was conducted. Associations were tested between bladder base tenderness and variables on history/examination using bivariate analyses and multiple logistic regression.

**Main Outcome Measure.** Deep dyspareunia and superficial dyspareunia (present/absent) were the main outcome measures.

**Results.** Bladder base tenderness was present in 34% of pelvic pain patients (65/189), which was significantly greater than the prevalence of bladder base tenderness of 3% (1/32) in a control sample of women without pelvic pain (odds ratio [OR] = 16.3, 95% confidence interval [CI] 2.17–121.7, Fisher exact test,  $P < 0.001$ ). For the pelvic pain patients, on bivariate analyses, bladder base tenderness was significantly associated with deep dyspareunia ( $P < 0.001$ ), superficial dyspareunia ( $P < 0.001$ ), bladder symptoms ( $P = 0.026$ ), abdominal wall trigger point ( $P < 0.001$ ), and pelvic floor tenderness ( $P < 0.001$ ). In contrast, bladder base tenderness was similarly present in women with or without endometriosis. On logistic regression, bladder base tenderness was independently associated with only deep dyspareunia (OR = 6.40, 95% CI: 1.25–32.7,  $P = 0.011$ ), abdominal wall trigger point (OR = 3.44, 95% CI: 1.01–11.7,  $P = 0.037$ ), and pelvic floor tenderness (OR = 8.22, 95% CI: 3.27–20.7,  $P < 0.001$ ).

**Conclusions.** Bladder base tenderness is present in one-third of women with pelvic pain, and contributes specifically to the symptom of deep dyspareunia. Bladder base tenderness was also associated with the presence of an abdominal wall trigger point and with pelvic floor tenderness, suggesting a myofascial etiology and/or nervous system sensitization. **Nourmoussavi M, Bodmer-Roy S, Mui J, Mawji N, Williams C, Allaire C, and Yong PJ. Bladder base tenderness in the etiology of deep dyspareunia. J Sex Med 2014;11:3078–3084.**

**Key Words.** Dyspareunia; Bladder; Endometriosis; Chronic Pelvic Pain; Pelvic Floor Tenderness

### Introduction

Chronic pelvic pain affects ~15% of women worldwide [1]. Women with pelvic pain can experience multiple symptoms including dysmenorrhea, daily pelvic pain, and dyspareunia. A comprehensive pelvic exam is important in women with pelvic pain, yet is often not reported in published studies of pelvic pain [2]. For example,

tenderness and nodularity of the uterosacral ligaments and pouch of Douglas on pelvic exam are well known to be associated with endometriosis [3].

The bladder base (at the anterior vaginal wall) can also be palpated for tenderness on pelvic exam, although little data have been published on the clinical implications of bladder base tenderness [2]. Bladder base tenderness is present in some women

with interstitial cystitis with a variable incidence in the literature, while greater sensitivity of the bladder base has been observed in women with chronic pelvic pain [4–6]. In addition, bladder base tenderness was found to be associated with a diagnosis of endometriosis in women with unexplained infertility [7]. Whether bladder base tenderness contributes to specific patient symptoms is unknown, although anatomically, it is presumed that a tender bladder base could potentially be associated with dyspareunia.

### Aims

The aim of this retrospective study was to determine whether bladder base tenderness is associated with specific symptoms/signs in women with pelvic pain, with particular emphasis on dyspareunia (deep and superficial).

### Methods

This is a retrospective chart review of consecutive pelvic pain patients seen by a gynecologist (P.J. Yong) at the BC Women's Centre for Pelvic Pain and Endometriosis, which is the tertiary referral center for the province of British Columbia as previously described [8]. Inclusion criterion was consecutive new patient consultations for pelvic pain between January and December 2012. Exclusion criterion was inability to perform a pelvic exam (e.g., due to severe vaginismus). This study was approved by the research ethics board of the University of British Columbia (H12-01802 and H13-01325) and was exempted from obtaining informed consent as it was a retrospective review. The study met the Strengthening the Reporting of Observational studies in Epidemiology (STROBE) criteria.

Charts were reviewed for the variable of interest: bladder base tenderness. During a single-digit pelvic exam, the bladder base (anterior vaginal wall) was palpated for tenderness. The bladder base was specifically palpated separately from the urethra.

Charts were also reviewed for demographic factors (e.g., age, parity, body mass index [BMI], referral with a known diagnosis of interstitial cystitis, and endometriosis), patient symptoms (e.g., dysmenorrhea, chronic pelvic pain, deep dyspareunia, superficial dyspareunia, bowel symptoms such as diarrhea and/or constipation, and bladder symptoms such as frequency and urgency), and physical exam signs (e.g., positive Carnett test for abdominal wall trigger points of the right lower

quadrant, left lower quadrant, and suprapubically [9] and tenderness of the levator ani bilaterally in the pelvic floor). At referral, patients were identified as having known interstitial cystitis if the diagnosis had been previously made by a urologist. Endometriosis was diagnosed at laparoscopy either previously in the community or during care at the center, with or without histological confirmation, as recommended by a recent consensus statement for endometriosis research [10]. Dysmenorrhea was defined as menstrual cramps. Chronic pelvic pain was defined as any other non-dysmenorrhea pelvic pain, which could be right, left, or central and could be daily or intermittent, with or without cyclical exacerbation. For superficial dyspareunia and deep dyspareunia, patients not sexually active were excluded.

The first analysis was to calculate the prevalence of bladder base tenderness in this pelvic pain sample. This prevalence was then compared with the prevalence of bladder base tenderness in a control sample of consecutive non-pain gynecology patients also seen by the same gynecologist for a new patient consultation from January 2012 to April 2013, in which digital pelvic exam to palpate the bladder base was routinely performed (Fisher exact test). These non-pain patients were referred for fibroids, ovarian cysts, endometrial/cervical polyps, abnormal uterine bleeding, or infertility.

The second analysis was to test for associations between bladder base tenderness (present/absent) and the other variables collected on chart review, in the pelvic pain sample. Variables on chart review were coded as binary (e.g., deep dyspareunia present/absent), except for age and BMI. Initially, bivariate analyses were performed using the Fisher exact test or Mann–Whitney test. Correction for multiple comparisons was not done, as the bivariate analyses were used to screen for variables to enter into the regression model. Next, multiple logistic regression was carried out using likelihood ratio modeling to determine which variables were independently associated with bladder base tenderness. Regression assumptions were checked, and all  $2 \times 2$  interactions were tested with Bonferroni correction for multiple comparisons.

In a sub-analysis, the analysis was repeated for bladder base tenderness that patients rated as moderate or severe, compared with women with only mild or absent bladder base tenderness.

Alpha and statistical significance was  $P < 0.05$  (two-tailed) for all analyses. Means are expressed  $\pm$  one standard deviation and odds ratios (ORs) with 95% confidence intervals (CIs). All statistics were

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