

# Association of Vulvar Symptoms With Pelvic Organ Prolapse and Urinary Incontinence

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**Objective:** The aim of this study was to compare vulvar symptoms between urogynecology patients diagnosed with urinary incontinence (UI) and/or pelvic organ prolapse to women presenting for annual gynecological care.

**Methods:** This is a retrospective cross-sectional study. Vulvar symptoms (burning, pain, itching, dyspareunia, and discharge) were measured by asking respondents to rate the severity of each symptom from 0 (none) to 10 (most severe). Patient history, diagnoses, and the Urogenital Distress Inventory-6 (UDI-6) score were abstracted from records. Vulvar symptom results were categorized (0, none; 1–3), mild;  $\geq 4$ , moderate to severe). Logistic regression models explored whether UI symptoms (UDI-6) and urogynecology diagnoses were associated with each vulvar symptom (moderate to severe vs none).

**Results:** A total of 606 urogynecology patients grouped by the following urogynecology clinical diagnoses: UI (n = 230), prolapse (n = 193), UI + prolapse (n = 183), and 258 controls (general gynecology patients) were included. The mean ( $\pm$  SD) age (years) was  $57.5 \pm 16.1$ ,  $62.4 \pm 13.9$ ,  $59.0 \pm 14.9$ , and  $41.3 \pm 13.8$  in the UI, prolapse, UI + prolapse, and control groups, respectively ( $p < .01$ ). Increasing urinary symptoms were associated with all vulvar symptoms (odds ratio [OR], 1.1–1.2 for each 1 point increase in UDI-6;  $p < 0.05$  for all). Prolapse and UI + prolapse diagnoses (compared with controls) were associated with vulvar burning (OR [95% confidence interval {CI}], 2.5 [1.2–5.0] and 2.9 [1.3–6.1] and pain (OR [95% CI], 3.6 [1.5–8.5] and 3.3 [1.4–8.2], respectively). Prolapse diagnoses were also associated with dyspareunia (OR [95% CI], 5.4 [2.2–13.3]).

**Conclusions:** Patients with pelvic organ prolapse are more likely to report vulvar burning, pain, and dyspareunia than gynecologic control patients. Urinary symptoms were associated with all vulvar symptoms.

**Key Words:** vulvar, vulvar symptoms, urogynecology, urinary incontinence, pelvic organ prolapse

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**P**elvic organ prolapse describes the descent of the uterus and/or vaginal walls within the vaginal canal or through the vaginal opening. Prolapse can be classified according to which anatomical site is affected and is best quantified and staged using the Pelvic Organ Prolapse Quantification system.<sup>1</sup> Anterior wall prolapse is often referred to as a cystocele or urethrocele, posterior wall prolapse describes a rectocele or enterocele, and apical prolapse describes uterine prolapse or posthysterectomy vaginal vault prolapse.<sup>1</sup> Risks for pelvic organ prolapse include childbirth, previous hysterectomy, increasing age, chronic constipation, and chronic high intra-abdominal pressure.<sup>2</sup>

Urinary incontinence (UI) is defined as any involuntary leakage of urine and can be broadly divided into stress incontinence (loss of urine with physical exertion, e.g. sneezing or coughing),

and urgency incontinence (involuntary urine leakage associated with urgency).<sup>3</sup> Established risk factors for stress UI include pregnancy, childbirth, previous hysterectomy, and pelvic organ prolapse.<sup>3</sup> Risk factors for urgency incontinence include recent urinary tract infection, higher body mass index, advancing age, smoking, and caffeine use.<sup>3</sup>

These disorders are very common, with almost 50% of women experiencing some symptoms of pelvic organ prolapse and/or UI in their lifetime.<sup>4</sup> By 80 years old, greater than 10% of women will undergo surgery for either pelvic organ prolapse or UI.<sup>4</sup> Ellerkmann et al<sup>5</sup> found that pelvic organ prolapse was associated with symptoms of voiding dysfunction, pelvic pressure, and sexual dysfunction, and that the severity of these symptoms were correlated with the severity of prolapse. Digesu et al,<sup>4</sup> found urinary frequency, urgency, incontinence, straining, and poor stream with vaginal prolapse. Pelvic organ prolapse has been associated with adverse body image and decreased quality of life,<sup>6</sup> as well as bowel dysfunction.<sup>7</sup> Urinary incontinence has been associated with low libido, vaginal dryness, and dyspareunia.<sup>8</sup>

There is currently little research about the relationship of pelvic organ prolapse to vulvar disease. Vulvar complaints in elderly women are common and often attributed to atrophy and lack of estrogen, although infections, chronic dermatologic conditions (e.g., lichen sclerosus), and neoplasia must be ruled out.<sup>9</sup> While previous research has shown an association between UI and increased vulvar symptoms and also between painful bladder syndrome and vulvar disease,<sup>10</sup> most research regarding vulvar and vaginal symptoms has focused primarily on infectious and dermatological causes. Until now, the relationship between vulvar symptoms and pelvic organ prolapse has remained unexplored.

Our study objective was to compare the prevalence and severity of vulvar symptoms in women with pelvic organ prolapse and/or UI to women presenting for annual gynecologic care.

## METHODS

This retrospective cross-sectional study included patients seen for initial visits in the urogynecology clinic at the University of Iowa Hospital Clinics between January 1, 2005 and December 31, 2006 (606 patients) and general gynecology clinic for routine annual care (258 patients). The University of Iowa Internal Review Board approved the study.

Prevalence and severity of vulvar symptoms (burning, itching, pain, dyspareunia, and vaginal discharge) were compared between women in the general gynecology clinic and those in the urogynecology clinic. Those in the urogynecology clinic were subdivided into those with UI, pelvic organ prolapse, or both based on primary diagnosis as assigned by provider.

Vulvar symptoms (burning, pain, itching, dyspareunia, and discharge) were measured using a Numeric Rating Scale by asking respondents to rate the severity of each symptom from 0 (none) to 10 (most severe), and the results were categorized as none (0), mild (1–3), and moderate to severe ( $\geq 4$ ) for each symptom. Patient demographic and physical examination information as well as diagnoses and the Urogenital Distress Inventory-6 (UDI-6) scores were abstracted from electronic

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**TABLE 1.** Urogynecology and General Gynecology (Control) Population Characteristics

	Control (258)	UI (230)	POP (193)	UI + POP (183)	<i>p</i>
Age, mean (SD), y	41.3 (13.8)	57.5 (16.1)	62.4 (13.9)	59.0 (14.9)	<.0001
Marital status, %	84.50	55.22	63.21	63.93	<.0001
BMI kg/m <sup>2</sup> , mean (SD)	27.2 (6.9)	31.4 (7.5)	29.6 (8.4)	31.1 (13.5)	<.0001
Hysterectomy, %	10.32	41.05	48.70	40.44	<.0001
Postmenopausal, %	26.74	61.30	72.54	60.66	<.0001
Vaginal deliveries, N	1.24	2.61	3.09	2.99	<.0001
Smoker, %	8.8	16.67	12.88	20.55	.0068
Pad use %	39.06	81.07	41.71	67.26	<.0001
UDI-6 score, mean (SD)	3.6 (4.2)	13.2 (5.7)	6.9 (5.7)	14.4 (6.1)	<.0001

BMI indicates body mass index; POP, pelvic organ prolapse.

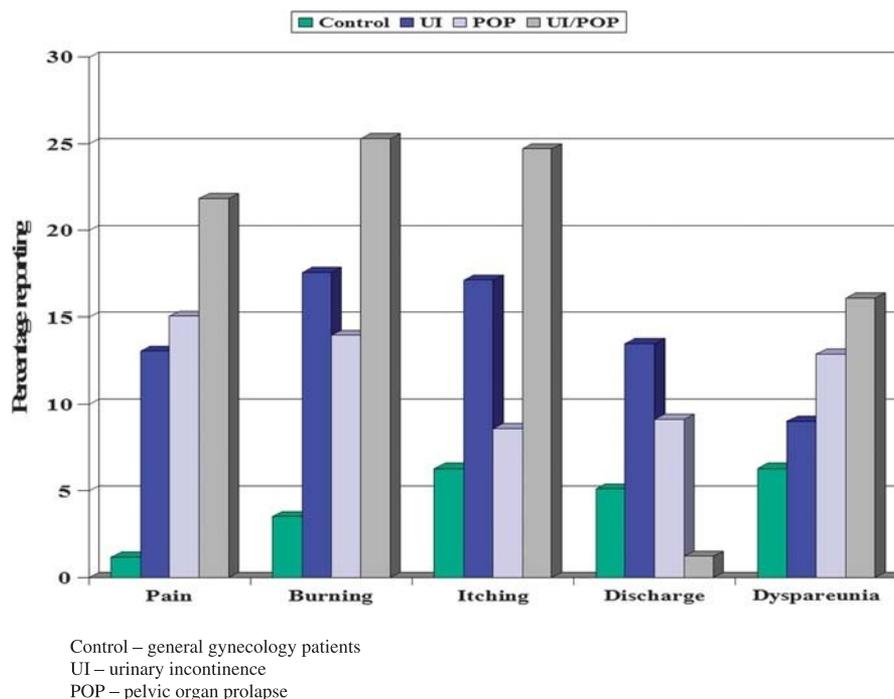
medical records. The UDI-6 is a commonly-used questionnaire designed to assess the frequency and bother of 6 urinary symptoms (frequent urination, leakage with urgency, leakage with activity/coughing/sneezing, small volume leakage, difficulty with bladder emptying, and abdominal or pelvic pain), and has been given an A grade recommendation by the Fourth International Consultation on Incontinence.<sup>11,12</sup> Respondents were asked whether they experience each symptom, and if so, how much the symptom bothers them on a scale of 1 (not at all) to 4 (quite a bit). Scores range from 0 to 24, with higher scores reflecting more severe bother.

Patient characteristics and vulvar symptoms were compared between patient groups and associations between demographic and patient characteristics, and each vulvar symptom were studied using analysis of variance or  $\chi^2$  tests. Logistic regression models were used to study associations between the 4 patient groups (UI, prolapse, UI and prolapse, controls) and vulvar symptoms (moderate to severe symptoms vs no symptoms), while adjusting for other variables. Each of the vulvar symptoms were entered as dependent variables in separate regression models with patient

group as the primary independent variable. Other variables that differed between the patient groups including, age, marital status, body mass index, hysterectomy, menopause, number of vaginal deliveries, pad use, and UDI-6 score (see Table 1) were included in the models to adjust for possible confounding. Odds ratios (ORs) were estimated and 95% confidence intervals (CIs) were calculated using the standard errors from the logistic regression models based on the normal approximation or Fisher exact test as appropriate.

## RESULTS

Six hundred six urogynecology patients were included in the study. Urogynecology clinical diagnoses included UI (n = 230), prolapse (n = 193), UI + prolapse (n = 183), and compared with 258 controls (gynecology patients). Urogynecology and general gynecologic patient characteristics are presented in Table 1. Urogynecology patients compared with general gynecology patients were older and had more vaginal births. They were also heavier and more likely to have had previous hysterectomy. In

**FIGURE 1.** Frequency of moderate-to-severe symptoms.

addition, urogynecology patients were more likely to endorse the presence of vulvar symptoms in general, and moderate to severe vulvar symptoms as presented in Figure 1.

In multivariable analyses (adjusted for the covariates in Table 1), prolapse and UI + prolapse diagnoses (compared with controls) were associated with vulvar burning (OR [95% CI], 2.5 [1.2–5.0] and 2.9 [1.3–6.1]) and vulvar pain (OR [95% CI], 3.6 [1.5–8.5] and 3.3 [1.4–8.2], respectively). Patients with UI were not more likely to have vulvar burning or pain. Prolapse diagnoses were also associated with dyspareunia (OR [95% CI], 5.4 (2.2–13.3)), but the UI and prolapse + UI groups did not report more dyspareunia.

Prolapse and UI diagnoses were not associated with vulvar itching and vaginal discharge symptoms in multivariable analyses. Increasing urinary symptoms were associated with all 5 vulvar and vaginal symptoms (OR, 1.1–1.2 for each 1 point increase in UDI-6;  $p < .05$  in all models).

## DISCUSSION

Our results indicate that in our center, urogynecology patients with pelvic organ prolapse have increased incidence of vulvar and vaginal symptoms including burning, vulvar pain, and dyspareunia. Increasing urinary symptoms were associated with all vulvar symptoms. These associations remained significant after adjusting for potential confounding factors.

These results are significant in their impact on clinical care. Current treatments for pelvic organ prolapse include pessary use, Kegel exercises, weight loss, and reconstructive surgical procedures. Although correlation does not equal causation, it is clear from our results that women with prolapse should be asked about vulvar pain, burning, and dyspareunia, and treatment of prolapse should also include careful inspection of the vulvovaginal region to include treatment of any conditions identified.

Theories for why prolapse is associated with vulvar pain, burning, and dyspareunia could include the abnormal pressure of protruding organs causing friction and irritation to the epithelium of the vagina and vulva. Others have hypothesized that vulvar pain may (in some cases) be caused by laxity in the uterosacral ligaments or related to perineal descent, which are conditions related to pelvic organ prolapse.<sup>13,14</sup> In fact, the 2015 consensus terminology report for vulvar pain and vulvodinia included “structural defects” as 1 potential factor associated with vulvodinia.<sup>15</sup> It is possible that there are more connections between differing pelvic floor disorders than are yet realized. Kennedy et al,<sup>10</sup> describes this theory after demonstrating associations between painful bladder syndrome, functional bowel disorders, and vulvar diseases, which may reflect a common origin for these disorders, and hypothesized a systemic pelvic floor pain disorder rather than separate vulvar/vaginal diseases.

Further research is needed to delineate the impact of prolapse severity on vulvar symptoms and the impact of different types of incontinence (and urinary symptoms) on vulvar symptoms, because these populations were combined for analysis. For example, Bradley and Nygaard<sup>16</sup> found differences in pelvic floor symptoms with different prolapse severity, and recommended diagnosis of prolapse only after descensus at or below the hymen. Similarly, Swift et al<sup>17</sup> found increased symptoms with prolapse beyond hymenal remnants. Although we did not test this in the current study, it would be logical if vulvar symptoms were also more likely to occur in patients with prolapse that descended to the hymen or beyond, and we hope to consider this in future analyses to add to the clinical relevance of our results.

Follow-up studies are also needed to demonstrate improvement (or lack of improvement) in vulvar symptoms with treatment of pelvic organ prolapse and/or UI. Achtari and Dwyer<sup>18</sup>

demonstrated improvement in sexual function after stress incontinence surgery and improvement in body image and sexual function after pelvic organ prolapse reconstructive surgery (although a small but significant number actually report worsened sexual function after repair). Vulvar symptoms are also associated with sexual dysfunction,<sup>19,20</sup> and it is possible that sexual function improvements after treatment for UI or prolapse may result (at least in part) because of resolution of vulvar symptoms. The impact of surgical treatment on vulvar pain and burning is also an area of further research.

Study limitations are primarily related to the retrospective study design and inclusion of patients from a single academic referral center. Moreover, urogynecology and general gynecology (control) patients differed in age and other factors. Although we adjusted for these differences in our analyses, it is possible that differences in other unmeasured variables might confound our results. For example, we were able to adjust for pad use, which was associated with vulvar symptoms, but we did not collect additional details such as duration of pad use or specific brand used, and thus we were unable to consider if these factors impacted results.

Because this is a cross-sectional study, we do not know whether the associations described are because of a common origin of the disorders or whether treatments for 1 disorder may exacerbate or cause the other disorders. However, from a clinical point of view, it is clear that women with pelvic organ prolapse and UI should be queried about vulvar symptoms and treated accordingly.

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