Published in final edited form as:

Female Pelvic Med Reconstr Surg. 2015 ; 21(4): 211–214. doi:10.1097/SPV.0000000000000184.

Lower Urinary Tract and Functional Bowel Symptoms in Women with Vulvar Diseases and Controls

Carolyn W. Swenson, MD¹, Stacy. B. Menees, MD², Hope K. Haefner, MD¹, and Mitchell. B. Berger, MD, PhD¹

¹Obstetrics & Gynecology, University of Michigan, Ann Arbor, MI, United States

²Internal Medicine, University of Michigan Health System, Ann Arbor, MI, United States

Abstract

Objectives—This study aims to compare the prevalences of lower urinary tract symptoms (LUTS), irritable bowel syndrome (IBS) and constipation in women with vulvar diseases to those from the general population.

Methods—Three groups of women were recruited from the University of Michigan Gynecology clinics, women with: 1) biopsy proven lichen sclerosus (LS), 2) non-LS vulvar diseases (vulvar controls, VC), and 3) presenting for annual exams (AE). All patients completed self-administered surveys and validated pelvic floor symptom questionnaires.

Results—317 subjects were enrolled: 101 with LS, 86 VCs, and 130 AEs. Compared to women in the VC and AE groups, LS subjects were older and of higher parity, and also had a higher prevalence of overactive bladder (OAB) and urinary incontinence. IBS was more common in the LS and VC groups compared to the AE group but no difference in constipation was seen. Similar results were found when all women with vulvar disease (LS and VC) were compared to the AEs. Age (adjusted OR 1.28, $p=0.003$) and IBS (adjusted OR 3.05, $p<0.001$) were the two variables predictive of OAB. Urinary incontinence was predicted by age (adjusted OR 1.35, $p=0.002$), vulvar disease categorization (adjusted OR 2.31, $p=0.004$) and IBS (adjusted OR 4.51, $p<0.001$).

Conclusions—We find a significantly greater prevalence of LUTS and IBS in women with vulvar disease compared to women presenting for annual gynecologic exams, but no difference in constipation. Similar rates of LUTS, IBS and constipation were seen in women with LS and non-LS vulvar disease.

Keywords

Vulvar disease; urinary incontinence; overactive bladder; constipation; IBS

Introduction

Vulvar disorders, a heterogeneous group of conditions, significantly impact the quality of life in many patients. Consequently, symptoms of vulvar disorders are a common presenting

complaint from women seeking gynecologic care. Lichen sclerosus (LS) is a chronic, often painful and disfiguring vulvar dermatosis that can affect children and adults. It tends to have two peaks of onset, prepubertal girls and perimenopausal or postmenopausal women [1]. While the true prevalence remains unknown, it has been reported to occur in up to 1 in 30 elderly women [2] to 1 in 59 women in a general gynecology practice to 1 in 300 to 1000 patients referred to dermatologists [3-6].

Some studies have suggested that instead of being isolated to the vulvar skin, certain vulvar diseases may actually be symptomatic of a generalized pelvic floor disorder with the potential to manifest symptoms in nearby structures such as the bladder and bowel [7, 8]. For example, pain syndromes such as fibromyalgia and temporomandibular joint syndrome have been found to occur significantly more frequently in women with vulvar LS [9]. Although the primary complaint of women with anogenital LS is commonly pruritus and pain, these women often have comorbid bladder and bowel disorders, including overactive bladder (OAB), urinary incontinence, inflammatory bowel disease, constipation or irritable bowel syndrome (IBS) [9, 10]. Kennedy, et al., reported a 2-fold increase in both painful bladder syndrome and IBS in women presenting to a vulvar specialty clinic compared to controls [7].

The goal of our study was to further investigate the association between bowel and bladder symptoms in women with vulvar diseases. Specifically, we sought to compare the prevalence of self-reported lower urinary tract symptoms (LUTS), including urinary incontinence and OAB, and bowel disorders, including constipation and IBS, in women with LS and women with other vulvar diseases as well as women from the general population to see if the presence of vulvar disease and, specifically LS, confers a greater risk of these comorbidities.

Materials and Methods

We performed a cross-sectional study of women 18 years or older presenting to the University of Michigan Gynecology clinics from August 2011 to June 2013. Approval was obtained from the University of Michigan Institutional Review Board (HUM00050044, HUM00051446 and HUM00056925). Three groups were recruited: 1) women with biopsy-proven LS, 2) vulvar controls, who were women with non-lichenoid vulvar diseases (lichen sclerosus or lichen planus), and 3) women presenting for annual exams. Subjects with LS as well as the vulvar controls were recruited from the University of Michigan Center for Vulvar Diseases and those presenting for annual exams were recruited from the general gynecology clinics. Eligible participants needed to be proficient in reading and writing English. Exclusion criteria included history of radiation to the abdomen or pelvis, history of gastrointestinal malignancy, coexistent LS and lichen planus, or inability to provide informed consent. Because LS and lichen planus are very similar pathologically, women with lichen planus are prone to receiving an erroneous diagnosis of LS as well. Therefore, in order to maintain the integrity of our LS cohort, we chose to exclude women with co-existent LS and lichen planus. Subjects with vulvar diseases were approached at the time of their clinic visits and screened for eligibility. If eligible and willing to participate, informed consent was obtained. For the annual exam subjects, all patients aged 18 years and older

scheduled for an annual exam were offered participation in the study at the time of registration in the clinic. Due to the anonymous nature of the surveys, a cover letter with a waiver of informed consent was included with the study questionnaire.

All study participants provided baseline demographic information including age, gravidity, parity, and number of vaginal births. Subjects were also asked to complete four self-administered validated questionnaires- the Medical, Social and Epidemiologic Aspects of Aging (MESA) [11], the Overactive Bladder – 8 Question Version (OAB-V8) [12], the Bristol stool scale [13], and the Rome III Functional Bowel Disorders Questionnaire [14]. The MESA questionnaire assesses urinary incontinence symptoms using the responses of “Never”, “Rarely”, “Sometimes”, or “Often” to 15 questions addressing various incontinence-precipitating scenarios. Urinary incontinence was defined by answering “Sometimes” or “Often” to any of the questions on the MESA questionnaire. Stress urinary incontinence (SUI) was defined by an answer of “Sometimes” or “Often” to one or more of questions 1 through 9 on the MESA questionnaire, all of which address stress provocative events. Similarly, urgency urinary incontinence (UUI) was defined by an answer of “Sometimes” or “Often” to one or more MESA questions 10 through 15, all of which address urgency events. Overactive bladder (OAB) was defined by a score of 8 or greater on the OAB-V8 [12]. Constipation was defined using the Rome III diagnostic criteria for functional constipation or as having a typical stool form of type 1 or 2 on the Bristol stool scale. Irritable bowel syndrome (IBS) was defined using the Rome III criteria.

Data were analyzed using IBM SPSS version 19.0 (IBM SPSS Inc., Chicago, Illinois). The chi-square test, analysis of variance, Kruskal-Wallis and independent t-tests were used where appropriate. Logistic regression was performed to control for age, parity, white race, and vulvar disease categorization. A p value <0.05 was considered significant.

Results

Completed questionnaires were available for 331 women: 101 with lichen sclerosus, 100 vulvar controls, and 130 presenting for annual exams. Women with LS were significantly older than women with other vulvar diseases (mean age 57.8 ± 13.7 vs 47.1 ± 15.1 yrs., $p < 0.001$) or those presenting for annual exams (mean age 57.8 ± 13.7 vs 41.5 ± 13.8 yrs., $p < 0.001$). Women with LS also had greater parity than women with other vulvar diseases (median 2 vs 1, $p < 0.001$) and women presenting for annual exams (median 2 vs 0, $p < 0.001$). The majority of women in all three groups were Caucasian; however, there was a significantly lower proportion of Caucasian women in the annual exam group than in the LS group (85.9% vs 95.0%, $p = 0.02$) or vulvar controls (85.9% vs 94.0%, $p = 0.049$). Vulvar conditions of women in the vulvar control group included: vulvodynia, (n= 52), vulvar intra-epithelial neoplasia (n=17), hidradenitis suppurativa (n=6), vulvar pruritus (n=5), recurrent Candida infections (n=3), Paget's disease (n=3), lichen simplex chronicus (n=2), lymphangioma circumscriptum (n=2), melanoma in situ (n=2), compound nevus with atypia (n=2), Sjogren's (n=2), Bechet's (n=1), and vulvar Crohn's disease (n=1).

Results regarding bladder symptoms, constipation and IBS are shown in Table 1. When compared to the annual exams, women with vulvar disease (both LS and vulvar controls)

had significantly more OAB, higher total MESA scores, greater prevalence of both stress and urgency incontinence, and higher prevalence of IBS. Prevalence of constipation by either Bristol or Rome III criteria was similar in all three groups. We did not see any significant differences when comparing the LS group and vulvar controls in any of the variables.

The LS subjects and the vulvar controls were analyzed together as one group (“vulvar diseases”) and compared to women presenting for annual exams (Table 2). Women with vulvar diseases had significantly higher rates of OAB ($p=0.001$) and higher MESA scores ($p<0.001$) than the annual controls. Although constipation defined by the Bristol or Rome III criteria was similar between groups ($p = 0.76$ and 0.52 , respectively), IBS was significantly more prevalent in women with vulvar diseases compared to those presenting for annual exams ($p = 0.001$).

Logistic regression was then performed to identify factors that predict OAB. We first used bivariate analyses to distinguish characteristics that significantly associate with OAB. The factors independently associated with OAB were age, vulvar disease and IBS. Forward stepwise logistic regression was then performed using the variables identified as significant in bivariate analyses. The final model for the prediction of OAB includes age and IBS (Table 3). The same analyses were performed for urinary incontinence, as determined by the MESA questionnaire. Factors predictive of urinary incontinence were age, vulvar disease categorization, and IBS (Table 4). There was not a statistically significant interaction term between vulvar disease and IBS ($p = 0.06$). Finally, when logistic regression was performed to identify independent variables associated with IBS, the only significant association was presence of vulvar disease (OR 2.92; 95% CI, 1.56, 5.46, $p=0.001$).

Discussion

Our results suggest that women with vulvar diseases presenting to a tertiary referral vulvar clinic have 2-fold odds of OAB, SUI and UUI, and nearly 3-fold odds of IBS compared to women presenting for annual gynecologic exams. Of women with vulvar diseases, those with biopsy-proven LS had similar rates of OAB, urinary incontinence, IBS, and constipation compared to those with non-LS vulvar diseases.

In the current study, 48% of women with LS had OAB, a prevalence over 3-fold greater than what has been previously reported [9]. We utilized the OAB-V8, which is a validated questionnaire to diagnose OAB, whereas Berger, et al., relied on retrospective review of self-reported data which could have led to under-reporting the true prevalence. Our findings of an increased prevalence of both SUI and UUI in this population also support those of Berger et al [9]. This is in contrast to Kennedy and colleagues who found less urinary incontinence in women with LS than those presenting for annual examinations [7]. Of note, we did not exclude women with lichen simplex chronicus (LSC) from the non-LS vulvar disease group. This disorder, like LS, has been associated with increased frequency of urinary incontinence and painful bladder syndrome [7]. However, only two patients in the non-LS vulvar disease group carried this diagnosis and exclusion of these subjects did not significantly alter our findings (data not shown).

Prior studies have shown an association between vulvar diseases and IBS [7, 9] and our data are consistent with this relationship. We found IBS to be more than twice as prevalent in women with vulvar diseases compared to women presenting for annual exams, which is similar to previously reported data [8]. Additionally, after adjusting for co-variables, only the presence of vulvar disease was found to be predictive of IBS.

Despite the association between vulvar diseases and IBS, we did not find a similar relationship between constipation and vulvar diseases. The overall prevalence of self-reported constipation in our study group was similar to those seen in the general population (12-19%) [15]; however, it was lower than previously reported for women with vulvar diseases [7, 9]. Contrary to prior studies showing a 1.5-2-fold increase in bowel disorders in women with vulvar disease, the highest prevalence of constipation in our study (although not statistically significant) was seen in the women presenting for annual exams. This discrepancy may be attributed in part to how constipation was defined. We defined constipation using validated questionnaires, the Bristol stool scale and the Rome III Functional Bowel Disorders Questionnaire, whereas Berger, et al., relied on self-reported diagnoses in a retrospective chart review data.

There are several limitations of our study that should be acknowledged. Subjects with vulvar diseases were recruited from the tertiary care clinic at the University of Michigan Center for Vulvar Diseases. These patients are often referred because of severe disease, which could potentially bias our study and therefore reduce the generalizability of our results. Women with lichen sclerosus were older than the other groups, potentially affecting the results. Finally, because the vast majority of women in this study were Caucasian, we are unable to draw conclusion about other racial and ethnic groups. The strengths of this study include a large sample size and the use of validated pelvic floor questionnaires.

Our study found a high prevalence of OAB, urinary incontinence, and IBS in women with vulvar diseases. Women with these disorders often wear pads due to fear of bladder or bowel accidents. We hypothesize that contact with urine, stool and/or pads likely has a negative impact on vulvar tissues. Therefore, bladder and bowel symptoms could potentially exacerbate or even be the impetus for vulvar skin disease. Practitioners should be aware of and consider routinely screening for bladder and bowel symptoms in women with vulvar disease in an effort to decrease the overall morbidity of their disease, as well as pad use and type of pads utilized.

Acknowledgments

We gratefully acknowledge research support from the Michigan Institute for Clinical and Health Research (grant # U033055) and Blue Cross Blue Shield of Michigan Foundation (grant # 1829.PIRAP). Research reported in this manuscript was supported by the National Center for Advancing Translational Sciences of the National Institutes of Health under Award Numbers 2UL1TR000433 and UL1RR024986. Investigator support for M.B.B. was supported by the National Institute of Child Health and Human Development BIRCWH Career Development Award # K12 HD001438. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

References

1. McPherson T, Cooper S. Vulval lichen sclerosis and lichen planus. *Dermatol Ther.* 2010; 23(5): 523–32. [PubMed: 20868406]
2. Leibovitz A, et al. Vulvovaginal examinations in elderly nursing home women residents. *Arch Gerontol Geriatr.* 2000; 31(1):1–4. [PubMed: 10989157]
3. Jones RW, et al. Guidelines for the follow-up of women with vulvar lichen sclerosis in specialist clinics. *Am J Obstet Gynecol.* 2008; 198(5):496 e1–3. [PubMed: 17905173]
4. Wallace HJ. Lichen sclerosis et atrophicus. *Trans St Johns Hosp Dermatol Soc.* 1971; 57(1):9–30. [PubMed: 5570266]
5. Fischer GO. The commonest causes of symptomatic vulvar disease: a dermatologist's perspective. *Australas J Dermatol.* 1996; 37(1):12–8. [PubMed: 8936065]
6. Goldstein AT, et al. Prevalence of vulvar lichen sclerosis in a general gynecology practice. *J Reprod Med.* 2005; 50(7):477–80. [PubMed: 16130842]
7. Kennedy CM, et al. Bladder and bowel symptoms among women with vulvar disease: are they universal? *J Reprod Med.* 2007; 52(12):1073–8. [PubMed: 18210896]
8. Kennedy CM, et al. Vulvar disease: a pelvic floor pain disorder? *Am J Obstet Gynecol.* 2005; 192(6):1829–34. discussion 1834–5. [PubMed: 15970821]
9. Berger MB, et al. Rates of self-reported urinary, gastrointestinal, and pain comorbidities in women with vulvar lichen sclerosis. *J Low Genit Tract Dis.* 2012; 16(3):285–9. [PubMed: 22622339]
10. Saunders NA, Haefner HK. Vulvar lichen sclerosis in the elderly: pathophysiology and treatment update. *Drugs Aging.* 2009; 26(10):803–12. [PubMed: 19761274]
11. Herzog AR, et al. Two-year incidence, remission, and change patterns of urinary incontinence in noninstitutionalized older adults. *J Gerontol.* 1990; 45(2):M67–74. [PubMed: 2313045]
12. Coyne KS, et al. Validation of an overactive bladder awareness tool for use in primary care settings. *Adv Ther.* 2005; 22(4):381–94. [PubMed: 16418145]
13. O'Donnell LJ, Virjee J, Heaton KW. Detection of pseudodiarrhoea by simple clinical assessment of intestinal transit rate. *BMJ.* 1990; 300(6722):439–40. [PubMed: 2107897]
14. Longstreth GF, et al. Functional bowel disorders. *Gastroenterology.* 2006; 130(5):1480–91. [PubMed: 16678561]
15. Higgins PD, Johanson JF. Epidemiology of constipation in North America: a systematic review. *Am J Gastroenterol.* 2004; 99(4):750–9. [PubMed: 15089911]

Lower urinary tract symptoms, constipation, and IBS in women with lichen sclerosus, other vulvar diseases (vulvar controls), and women presenting for annual exams

Table 1

	Lichen Sclerosus (LS) (n = 98)	Vulvar Controls (VC) (n = 95)	Annual Exams (AE) (n = 114)	ANOVA p value	LS vs VC p value	VC vs AE p value	LS vs AE p value
OAB %	48.0 (47)	54.7 (52)	31.3 (35/112)	0.002	0.35	0.001	0.01
MESA total	9 (2.16; 0-37)	8 (3.17; 0-38)	0 (0.8; 0-26)	<0.001	0.99	<0.001	<0.001
MESA Incontinence %	70.8 (63/89)	74.4 (61/82)	41.6 (47/113)	<0.001	0.60	<0.001	<0.001
MESA Stress Incontinence %	67.4 (60/89)	68.7 (57/83)	38.4 (43/112)	<0.001	0.86	<0.001	<0.001
MESA Urgency Incontinence %	44.3 (39/88)	37.2 (32/86)	16.8 (19/113)	<0.001	0.34	0.001	<0.001
Constipation Bristol %	13.7 (13/95)	13.6 (12/88)	15.0 (16/107)	0.96	0.99	0.79	0.80
Constipation Rome III %	8.2 (8/97)	5.3 (9/95)	8.8 (10)	0.60	0.41	0.33	0.89
IBS %	28.7 (27/94)	32.6 (31/95)	13.2 (15)	0.002	0.56	0.001	0.005

Data presented as percentage (n/N) or median (IQR, total range)

P values determined from ANOVA, chi-squared and Kruskal Wallis test.

Table 2

Lower urinary tract symptoms, constipation, and IBS in women with vulvar disease (lichen sclerosis and other vulvar diseases) compared to women presenting for annual exams.

	All Vulvar Subjects (n = 193)	Annual Exams (n = 114)	p value
OAB %	51.3 (99/193)	31.3 (35)	0.001
MESA total	9 (3,16; 0-38)	0 (0,8; 0-26)	<0.001
MESA Incontinence %	72.5 (124/171)	41.6 (47/113)	<0.001
MESA Stress Incontinence %	68.0 (117/172)	38.4 (43/112)	<0.001
MESA Urgency Incontinence %	40.8 (71/174)	16.8 (19/113)	<0.001
Constipation Bristol %	13.7 (25/183)	15.0 (16/107)	0.76
Constipation Rome III %	6.8 (13/192)	8.8 (10/114)	0.52
IBS %	30.7 (58/189)	13.2 (15/114)	0.001

Data presented as percentage (n/N) or median (IQR, total range)

P values determined from ANOVA, chi-squared and Kruskal Wallis test.

Table 3
Factors predicting overactive bladder (OAB) using multivariable regression analysis

Variable	Crude Odds Ratio	Adjusted Odds Ratio	95% C.I.	Regression coefficient	Standard error	p value
Constant	-----		----	-1.31	0.31	<0.001
Age decile	1.28	1.28	1.09 – 1.50	0.24	0.08	0.003
IBS	2.86	3.05	1.72 – 5.42	1.12	0.29	<0.001

First did bivariate analyses using age, categorization as vulvar subjects (referent annual gynecology subjects), parity, constipation, white race (referent nonwhite) and IBS. The variables associated with OAB were age and IBS and this was confirmed with forward stepwise logistic regression (using LRs) starting with all same variables.

Table 4

Factors predicting urinary incontinence based on the Medical, Social and Epidemiologic Aspects of Aging (MESA) scale using multivariable regression analysis

Variable	Crude Odds Ratio	Adjusted Odds Ratio	95% C.I.	Regression coefficient	Standard error	p value
Constant	-----		-----	-1.37	0.35	<0.001
Age decile	1.42	1.35	1.12 – 1.62	0.30	0.10	0.002
Vulvar subjects	3.71	2.31	1.31 – 4.07	0.84	0.29	0.004
IBS	4.66	4.51	2.15 – 9.48	1.51	0.38	<0.001

First did bivariate analyses using age, categorization as vulvar subjects (referent annual gynecology subjects), parity, constipation, IBS and white race (referent nonwhite). The variables associated with incontinence based on MESA score were age, vulvar disease and IBS. This was confirmed with forward stepwise logistic regression (using LRs) starting with all same variables.