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Prevalence and demographic characteristics of vulvodynia in a population-based sample

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Abstract

OBJECTIVE—To determine the prevalence and characteristics of vulvodynia among women in southeast Michigan.

STUDY DESIGN—A population-based study of adult women was conducted, using telephone recruitment and completion of a self-administered survey. Weighted estimates of vulvodynia prevalence and characteristics were determined.

RESULTS—Over a year, 2542 women were recruited and 2269 (89.3%) completed the self-administered survey. The weighted prevalence of vulvodynia was 8.3% (95% CI=7.0, 9.8) or approximately 101,000 women in the targeted population. Prevalence remained stable through age 70, and thereafter declined. Among sexually active women, prevalence was similar at all ages. Of 208 women meeting vulvodynia criteria, 101 (48.6%) had sought treatment, and only 3 (1.4%) had been diagnosed with vulvodynia (unweighted values). Previous vulvodynia symptoms had resolved in 384 (16.9%) women after a mean duration of 12.5 years.

CONCLUSIONS—Vulvodynia is common, although rarely diagnosed. Prevalence remains high among sexually active women of any age.

Keywords

population-based; pain; prevalence; Vulvar Diseases/*epidemiology; vulvodynia

INTRODUCTION

Vulvodynia is a chronic pain condition associated with local hypersensitivity of the vulva that may be provoked (e.g., intercourse or tampon use), unprovoked (spontaneous), or both.[1] Although previously thought to be rare, chronic, and more common among White women,[2]

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recent studies suggest that vulvodynia may occur in 3–14% of women of all ethnicities[3–6] and may resolve in a substantial proportion of women.[3, 5–7] Nonetheless, the majority of women with vulvar pain remain undiagnosed and inadequately treated.[5, 6] The recent availability of a validated instrument to screen for vulvodynia based on survey responses allows women likely to have vulvodynia to be identified in the general population.[8]

We conducted a population-based study of women in a 4-county area of southeastern Michigan to evaluate the prevalence of current and past vulvodynia and to assess the demographic and pain characteristics of those with and without this syndrome.

MATERIALS AND METHODS

The study was approved by the Institutional Review Board at the University of Michigan School of Medicine.

Study population

We recruited a random sample of 2542 women, representative of women in a 4-county area in southeastern Michigan, using random digit dialing (RDD). In collaboration with the Survey Research Operations at the Institute for Social Research at the University of Michigan, we recruited women by calling landline telephone numbers purchased from Genesys – an RDD telephone frame vendor. When a household was reached and a woman aged 18 years or older lived in that household, the number of women and their ages were elicited. For households with more than one eligible woman, one woman was randomly designated as a potential participant. Eligible women were invited to participate in a study on women's health that would involve a brief telephone-screening interview to complete enrollment, an online or written survey within 2 weeks of enrollment, and a follow-up survey every 6 months for 3 years. After giving informed consent, women were enrolled in the longitudinal study.

The sampling strategy was designed to reflect the distribution of age and country of residence of women in the 4-county area as indicated by the 2000 census. To ensure that our sample would appropriately represent this distribution, the age-eligibility of potential additional participants was adjusted as enrollment proceeded. Hence, after 3 months, the age criterion was limited to age 18–60 years, and at 9 months to age 18–39 years. Following recruitment of 2505 women using landline numbers, an additional recruitment effort using cell phone numbers from the same area was implemented in order to access and increase representation of women aged 18–29 who did not have landline telephones. Cell phone recruitment was similar to landline recruitment, with modifications made consistent with cell phone safety (e.g. assuring the respondent was in a safe place to talk), and an additional 37 women were recruited. The number of landline telephones and cell phones accessed for personal use was determined for weighting purposes.

Informed consent information was given at the time of the telephone recruitment and again in the survey cover letter, and subsequent completion of the telephone interview and the survey implied consent. We sent each participant a letter introducing the survey with the initial $5 stipend, an enclosed survey, and a postage-paid return envelope or with the URL to access the online survey. A reminder letter or email was sent 2 weeks later, and survey reminder calls were made if no survey had been received after another 2 weeks. Every 6 months, follow-up surveys are being sent over a 3-year period. This paper focuses on the initial baseline survey data.

Survey instrument

The baseline questionnaire obtained information about the presence or absence of vulvar pain, the characteristics of this pain, and information about the women's demographic characteristics and reproductive health history. The survey instrument included previously validated questions that have been found to predict vulvodynia case status with substantial accuracy.[8]

Diagnostic criteria

The clinical status of each participant was categorized as a current vulvodynia case, a past vulvodynia case, having dyspareunia not consistent with vulvodynia, or a control without dyspareunia or vulvar pain. The diagnostic criteria for vulvodynia were based on our previously validated survey-based criteria.[8] A screening-based diagnosis of vulvodynia depended on having pain at the vulva or opening to the vagina that had been present for a minimum of 3 months, without resolution. Past cases were those whose history indicated they had had the vulvar pain lasting at least 3 months at some point in their life that had resolved. The diagnosis of dyspareunia was applied to women reporting pain with intercourse that did not meet criteria for vulvodynia based on location or duration. Controls included women who reported no current pain with intercourse and no vulvar pain. Because women not having intercourse may be unaware of their vulvar sensitivity, control women were subdivided into 2 categories -- strict controls (asymptomatic, who had had intercourse within 6 months) and controls with no intercourse (asymptomatic, but had not had intercourse within 6 months).

Statistical Analysis

Since a complex sampling design was employed for data collection, we carried out a weighted analysis using the SPSS Complex Samples module (IBM PASW Statistics 18). Details are given in the Appendix. In brief, the analyses were weighted for the probability of selection, for non-response, and for post-stratification alignment to the age and ethnicity population subgroups. The sampling weights accounted for the probability of selection based on the number of telephone numbers selected versus the number available in the 4-county area, the number of unique telephone numbers in each respondent's household, and the probability of within-household selection. In addition, non-response weights were created using a propensity score approach that was based on age, education, and ethnicity (factors associated with both likelihood of response and the vulvodynia case status). Post-stratification weights ensured that our sample properly represented the age cohorts (in 10-year categories) in each of the 4 counties in the 2000 census data All analyses used the weighted data.

The prevalence and 95% confidence intervals of vulvodynia were calculated for the total population and for each demographic subgroup. Demographic characteristics of vulvodynia cases versus all non-cases as well as versus strict controls were compared and prevalence odds ratios and their 95% confidence intervals calculated. Multivariable logistic regression was used to assess the association of demographic characteristics with the case status.

RESULTS

Between September 2008 and November 2009, 2542 women were recruited to the study (2505 via landline telephones and 37 via cell phones). Details of sampling and enrollment characteristics are provided in the Appendix. In brief, 66% of the working landline numbers were reached, and of these 64% had an eligible woman in the household. A total of 79% of the eligible landline respondents completed the telephone-screening interview and were enrolled in the longitudinal study. In the cell phone recruitment, the proportion of working

lines that identified an eligible female based on gender, age, and geographic location was substantially lower (16%), primarily due to reaching voicemail, male respondents, or younger women. However, once an eligible woman was identified, the screening completion rate of the cell phone recruitment was similar (76%) to that of the landline recruitment (p=0.55).

Of 2542 women enrolled, 21.4% (544) were aged 65 and over, compared to 23.0% of women in the 4-county census (p=0.06). Our sample approximated the ethnicities of the 4-county population, with 20.3% Black (N=515) and 73.5% White (N=1869), compared to 25.7% and 68.3%, respectively, in the population. In both our study sample and in the 4-county population, 2.8% described themselves as Hispanic.

Of the 89.3% (2269) who completed their baseline survey, 44.4% used the paper format and 55.6% completed it online. Compared to non-completers, women completing the baseline survey were younger (50.4±16.7 years vs. 54.2±19.2 years, p=0.002), more likely to be White (76.0% vs. 53.1%, p<0.001), and more highly educated (4.8% vs. 11.4% did not complete high school, p<0.001). In a multivariable analysis, age, education, and ethnicity remained statistically associated with survey completion. Completers and non-completers did not differ in lifetime history of pain with intercourse, or in reporting having past or current vulvar pain.

Within this 4-county area, there are approximately 1.4 million women aged 18 or older. The unweighted prevalence of vulvodynia by our screen was 9.2%, and the weighted prevalence was 8.3% (95% confidence interval (CI)= 7.0, 9.8) (Table 1). Another 17.9% of women reported symptoms suggestive of past vulvodynia. Based on the weighted analysis, 101,007 women in the 4-county area are estimated to have vulvar pain consistent with vulvodynia, with another 218,219 having a history of such pain that has since resolved.

The Figure illustrates the prevalence of each diagnostic category by decade of age. After age 70, the prevalence of vulvodynia declined, while the prevalence of women without vulvar symptoms who were not having intercourse increased. Thus, for older women, the true prevalence of vulvar sensitivity consistent with vulvodynia may be underestimated, due to lack of intercourse in a substantial subset. When we assessed the prevalence of vulvodynia among only those women who had had intercourse in the previous 6 months, no decrease in prevalence with age was found (p=0.70).

We further evaluated women in the perimenopausal age range (40–65 years) to assess whether symptoms attributable to atrophic vaginitis may be spuriously elevating the apparent prevalence of vulvodynia in that age group. Among the 40–65 year age-group 30.9% had been treated with hormone therapy (HT). The prevalence of vulvodynia was 13.9% among those who had taken HT and was 8.9%, among those who had not (p=0.19) indicating pain symptoms that persisted despite estrogen therapy.

As it is commonly believed that women with vulvar pain may be less likely to have intercourse, we examined the association between case status and frequency of intercourse in the past 6 months. Approximately 34.8% of women in the study reported having had no intercourse in the past 6 months. Reporting no intercourse in the past 6 months was most frequent in the control women (44.7%), followed by past cases (32.0%) and vulvodynia cases (12.3%), while those with some dyspareunia or vulvar pain but not meeting criteria for vulvodynia were *least* likely to report not having had intercourse at all during the reference time period (2.8%, p<0.001). The prevalence of vulvodynia was greatest in those having intercourse once or twice a month or once a week, (15.3% and 14.3%, respectively) and lower in those having intercourse more than once a week or not at all (6.4% and 4.8%, respectively, p<0.001). Married women were more likely to have had intercourse in the past

month (78.1%) compared to those who were not married (36.3%, p<0.001), and were more likely to screen positive for vulvodynia than were those not married (11.7% versus 6.2%, p<0.001). After controlling for having had intercourse in the past 6-months, the association between marriage and vulvodynia was no longer significant (p>0.37).

The relationships between the presence of vulvodynia and demographic characteristics are presented in Table 2. When comparing those with vulvodynia to all other women, the odds of having vulvodynia were statistically increased in younger women, in married women, in those who were employed, and in those who had had intercourse in the past 6 months, while prevalence was less in Black women. However, in the adjusted analysis, only the increased prevalence in those who were married and those having intercourse in the past 6 months, and a decreased odds in Black women remained significant. When we compared current vulvodynia cases to control women (those without dyspareunia, and no history of vulvar pain -- column II), decreased odds of case status were noted in Black women and increased odds in Hispanic women. In addition, the decline in odds in older women, and the increased odds in those who have had intercourse in the past 6 months remained. No relationship between vulvodynia case status and women's ability to pay for basics (food, etc.) was found (data not shown).

Characteristics of the pain were then evaluated. The mean age at pain onset was 30.5 years (95% CI 28.6, 32.5 years), with a median age of 30.0 and a range from age 6 to 70. The mean duration of pain was 12.4 years (95% CI 10.2, 14.5 years) with a range of 0.5 to 48 years, and a median of 8.0 years. Women who had had past symptoms of vulvodynia that had resolved (past cases) reported a mean pain duration of 12.5 years, similar to that reported by current cases.

Further pain characteristics are shown in Table 3. Over 40% reported discomfort continuing after intercourse. The majority had only provoked pain (64.8%), but a sizeable minority reported having only unprovoked pain (20.3%), or a mixed pain picture (14.9%). Vulvar pain totally prevented intercourse for only a minority (4.4%). Although the most frequent pain descriptors were "irritating," "burning," and "raw," 27.8% also described the pain as "itchy," with the mean number of descriptors chosen being 2.5 (95% CI = 2.3, 2.7).

Of the 208 women meeting criteria for vulvodynia, only 101 (48.6%) had sought treatment, and 58 (27.9%) had been given one of several diagnoses (Table 3, weighted data). Most of these had been diagnosed with estrogen deficiency (39.5% of those given one or more diagnoses), or a yeast infection (36.9%), but nevertheless were still reporting symptoms consistent with vulvodynia. Only 5.7% of those given a diagnosis, (or 2.0 % of all women screening positive for vulvodynia) had been given the diagnosis of vulvodynia or vestibulitis (a term previously used for localized vulvodynia). No difference was noted in the proportion of women who reported that their symptoms had resolved between those who had seen a physician for their symptoms (23.4%) and those who had not (24.6%. p=0.96), or among those who had consulted a physician, between those who had been given a diagnosis of vulvodynia (45.6%) and those who had not (48.7%, p=0.69).

COMMENT

Vulvodynia causes substantial pain and suffering for millions of women in the United States, yet the disorder remains underdiagnosed and inadequately treated.[5] The availability of a validated screening test that predicts the diagnosis permits estimation of the population prevalence.[8, 9] We found a prevalence of 8.3% in this population-based study of women over the age of 18 years. This report substantiates the sizeable numbers of women affected,

with over 100,000 women in the Detroit area alone predicted to have vulvodynia. Only 2.0% of those predicted to have vulvodynia in this study had been given this diagnosis previously.

This study, using a validated survey-based diagnostic screening test,[8] provides critical evidence of the substantial prevalence of this gynecological condition. This prevalence is consistent with the 7% prevalence reported in a previously reported population-based study by Harlow et. al,[5] but is greater than that reported by Arnold et. al.[6] Prior to these population-based studies, vulvodynia was thought to affect White women almost exclusively,[2] – a belief that came into question when community-based studies were conducted.[3–5] Our data suggest that Black women are less likely than White women to screen positive for vulvodynia, although the prevalence among Black women was also substantial (4.2% Black vs. 9.3% White). Although the number of Hispanic women in this study was limited, they had an increased prevalence of vulvodynia compared to White women, consistent with the findings of Harlow et al.[5] These ethnic differences may reflect a true difference in prevalence, or may reflect differences in symptom reporting or in interpretation of “pain” or “discomfort,” and therefore deserve further study. Additional studies in Hispanic populations are needed.

Screening instruments for a clinical diagnosis such as vulvodynia using survey-based criteria include a margin of error, but do identify women likely to have vulvodynia.[8, 9] Two previous validation studies of screening instruments, including the instrument used in this study, indicate sensitivities of 78.0–81.8% and specificities of greater than 96% when validated against a clinical exam.[8, 9] Given these sensitivities, the population-based prevalence reported here may still be somewhat underestimated. Application of these instruments in clinical settings can help identify women who may benefit from treatment. As with any screening test, confirmation of the diagnosis, and evaluation for other diagnoses contributing to the symptoms are required to confirm the diagnosis and begin treatment.

We had no upper age limit for enrollment in the study. Hence, we were able to demonstrate that the vulvodynia prevalence is high in all decades of life through age 70, and that even after this age the condition persists, albeit at a lower prevalence. Moreover, the finding that among those having intercourse, the decline in prevalence after age 70 is less marked suggests that the lower prevalence in the elderly may be a result of lack of intercourse that provokes the discomfort. Of interest, the self-reported prevalence of “past vulvodynia” also decreases in older women, consistent with decreased reporting of past symptoms as demonstrated in prior studies.[7] Further research on the vulvar pain experience of elderly women is warranted.

The high prevalence of women screening positive for vulvodynia among women in their fifties deserves attention. Our data indicate that the prevalence of vulvodynia symptoms is as high among those who have been treated with HT as among those who have not, suggesting the pain experienced is often not addressed with estrogen supplementation. However, whether a relationship exists between vulvodynia and the decline in estrogen during the menopausal transition specifically, or whether symptoms of vulvodynia are confounded by symptoms of vaginal atrophy associated with estrogen deficiency, or vice versa, deserves additional study. Further evaluation within this cohort of current and past hormonal exposures, of hormone-related symptoms, of the timing of the menopausal transition and of previous response to HT is the subject of a separate paper.

Contrary to previous assumptions, women with vulvodynia do not typically abstain from sexual intercourse,[10, 11] and, in fact, over 90% had had intercourse in the past 6 months. Women with current vulvodynia were less likely than control women to report *no* intercourse in the past 6 months. This finding may reflect the recurrent reminders of the

vulvar pain for those having intercourse, while those not having intercourse may erroneously believe the sensitivity has resolved. Assuming that continuing to have intercourse implies the pain with intercourse is not problematic is, however, unwarranted.

The average age of vulvodynia onset was approximately 30 years, with pain onset reported as young as age 6. Furthermore, 41.7% of women with vulvodynia reported pain with first intercourse, and 23.3% reported pain with first tampon use. Little has been written about vulvar pain in children and adolescents,[12] and hence this disorder is rarely considered in the young. These early symptoms suggest increased vulvar sensitivity may be present substantially earlier than the age at which the symptoms are recognized as a problem. Early symptoms may identify a prodromal period during which identification and intervention could impact long-term chronicity of this condition. Further study on early onset vulvodynia is needed.

The substantial percentage of women with vulvar pain who have not sought medical attention for the symptoms, and the small percentage of those seeking care who are given the diagnosis of vulvodynia are both noteworthy and consistent with a prior population-based study of this condition.[5] This failure to diagnose may be in part due to women being unaware that their pain may have a “cause” or “name” that could lead to treatment, and in part due to health providers being unfamiliar with the prevalence, presentations of, or treatments for this condition. This lack of familiarity may reflect the misperception that the predominant pain description in vulvodynia is “burning.” We found women frequently describe their discomfort as “irritation” and “rawness” with more than 25% reporting “itching” as well – descriptors that may lead to misdiagnosis if not further pursued. Most women given a diagnosis for their symptoms were diagnosed with either estrogen deficiency (46.6%) or a yeast infection (36.2%) – both disorders in which treatment typically leads to symptom resolution. These data suggest women with ongoing vulvar pain who are treated for estrogen deficiency or yeast infections should be followed to assure symptom resolution. Women with continued complaints should be reassessed.[13]

Limitations to the study exist. Women were primarily recruited via landline telephone contact, thereby limiting the generalizability of the findings. Although 82.5% of households were reported to have a landline at the time of our recruitment, approximately one-third of those renting their homes, one-third of those under that age of thirty, and one-fourth of those living in poverty have no landline telephone.[14] Although our results were weighted to reflect the distribution of age and county of residence in the 2000 census; it is possible that our population may under-represent women of lower socioeconomic position. Furthermore, even though the presumptive diagnosis of vulvodynia was based on validated survey-based criteria, a small proportion of cases may have a dermatologic (such as lichen sclerosus) or infectious (such as Candida vulvovaginitis) cause for their symptoms.

In conclusion, vulvodynia is a common pain syndrome affecting more than 8% of women at any one time, and more than one-quarter of women at some point in their lifespan. Yet, this disorder remains infrequently diagnosed and treated. This study clarifies that vulvodynia occurs at all ages, and that the prevalence during the menopausal transition and in the elderly (groups often excluded from such studies) remains substantial, particularly among women who remain sexually active. Additional study of factors associated with both new onset and with remission of vulvodynia is warranted, especially in children, adolescents, midlife women during the menopausal transition, and in the elderly.

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REFERENCES

1. Moyal-Barracco M, Lynch P. 2003 ISSVD terminology and classification of vulvodynia. A historical perspective. J Reprod Med. 2004; 49:772–777. [PubMed: 15568398]
2. Glazer HI, Ledger WJ. Clinical management of vulvodynia. Rev Gynaecol Pract. 2002; 2:83–90.
3. Reed BD, Crawford S, Couper M, Cave C, Haefner HK. Pain at the vulvar vestibule: a Web-based survey. J Lower Genit Tract Dis. 2004; 8:48–57.
4. Lavy RJ, Hynan LS, Haley RW. Prevalence of vulvar pain in an urban, minority population. J Reprod Med. 2007; 52:59–62. [PubMed: 17286071]
5. Harlow BL, Stewart EG. A population-based assessment of chronic unexplained vulvar pain: have we underestimated the prevalence of vulvodynia? J Am Med Wom Assoc. 2003; 58:82–88. [PubMed: 12744420]
6. Arnold LD, Bachmann GA, Rosen R, Rhoads GG. Assessment of vulvodynia symptoms in a sample of US women: a prevalence survey with a nested case control study. Am J Obstet Gynecol. 2007; 196:128, e1–e6. [PubMed: 17306651]
7. Reed BD, Haefner HK, Sen A, Gorenflo DW. Vulvodynia incidence and remission rates among adult women: A 2-year follow-up study. Obstet Gynecol. 2008; 112:231–237. [PubMed: 18669716]
8. Reed BD, Haefner HK, Harlow SD, Gorenflo DW, Sen A. Reliability and validity of self-reported symptoms for predicting vulvodynia. Obstet Gynecol. 2006; 108:906–913. [PubMed: 17012453]
9. Harlow BL, Vazquez G, MacLehose RF, Erickson DJ, Oakes JM, Duval SJ. Self-reported vulvar pain characteristics and their association with clinically confirmed vestibulodynia. J Womens Health (Larchmt). 2009; 18:1333–1340. [PubMed: 19743906]
10. Foster DC, Beth Kotok M, Huang LS, et al. The tampon test for vulvodynia treatment outcomes research: reliability, construct validity, and responsiveness. Obstet Gynecol. 2009; 113:825–832. [PubMed: 19305326]
11. Reed BD, Haefner HK, Punch MR, Roth RS, Gorenflo DW, Gillespie BW. Psychosocial and sexual functioning in women with vulvodynia and chronic pelvic pain. A comparative evaluation. J Reprod Med. 2000; 45:624–632. [PubMed: 10986680]
12. Reed BD, Cantor LE. Vulvodynia in preadolescent girls. J Low Genit Tract Dis. 2008; 12:257–261. [PubMed: 18820538]
13. Wu EQ, Birnbaum H, Kang YJ, et al. A retrospective claims database analysis to assess patterns of interstitial cystitis diagnosis. Curr Med Res Opin. 2006; 22:495–500. [PubMed: 16574033]
14. Blumberg, SJ.; Luke, JV. Wireless substitution: Early release of estimates from the National Health Interview Survey, January–June 2008: National Center for Health Statistics. 2008.

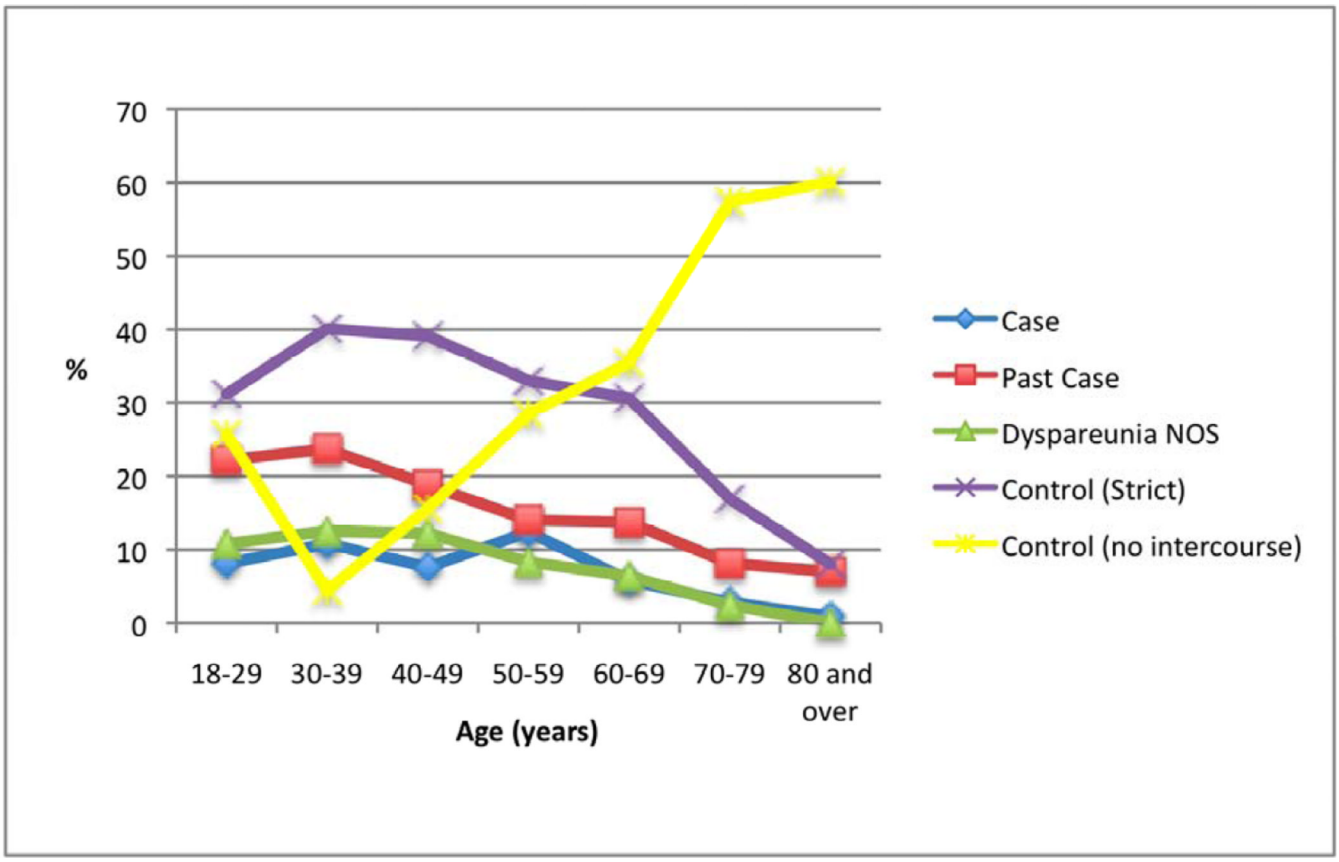

Figure.
Prevalence of clinical diagnostic groups stratified by 10-year age categories (weighted data).

Table 1

Population Estimates of Prevalence Within Each Diagnostic Group

Diagnostic category	% (N) (unweighted)	% (95% CI) (weighted)	Estimated # in population	
			N	95% CI
Case	9.2 (208)	8.3 (7.0, 9.8)	101,007	84,711–117,304
Past Case	17.0 (384)	18.0 (15.5, 20.7)	218,219	185,485–250,952
Dyspareunia not meeting vulvodynia criteria	9.4 (213)	9.6 (7.7, 11.7)	116,119	91,304–140,934
Control -- had intercourse	33.7 (761)	32.9 (29.9, 36.0)	399,453	362,979–435,928
Control -- no recent intercourse	24.9 (562)	24.2 (21.2, 27.6)	294,541	249,264–339,829
Data insufficient to categorize	5.9 (133)	7.1 (4.2, 12.5)	85,702	37,511–133,894

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Table 2

Relationship of Demographic Variables to Clinical Status. (Weighted Data, P<0.05 Indicated by Bolded OR's)

Variable	I. Current case (N=208) [a] versus all other groups (N=2053) II.				II. Current case (N=208) [a] versus Controls (N=1323) [b]		
	%	Prevalence vulvodynia (95% CI) [a]	OR (95% CI)	OR [c]	N	OR (95% CI)	OR [c]
Age							
>65	15.6	2.4 (0.8, 4.0)	**0.24 (0.12, 0.49)**	0.44 (0.19, 1.04)	18.0	**0.19 (0.09, 0.39)**	**0.38 (0.17, 0.87)**
18–65	84.4	9.4 (7.8, 11.0)	Reference	Reference	82.0	Reference	Reference
Ethnicity							
White	67.6	9.3 (7.6, 11.1)	Reference	Reference	*68.0*	Reference	Reference
Black	24.8	4.3 (2.2, 6.3)	**0.43 (0.25, 0.74)**	***0.59 (0.31, 0.97)***	*25.0*	**0.46 (0.24, 0.72)**	**0.52 (0.29, 0.91)**
Hispanic	2.7	15.6 (4.9, 27.3)	1.79 (0.77, 4.15)	*2.06 (0.86, 4.93)*	*2.2*	**2.49 (1.00, 6.19)**	**2.69 (1.04, 6.97)**
Other	4.9	10.7 (4.5, 16.8)	1.16 (0.59, 2.29)	*1.12 (0.53, 2.36)*	*4,9*	1.18 (0.59, 2.39)	1.07 (0.48, 2.39)
Education							
Graduated high school or less	31.5	6.1 (4.0, 8.2)	Reference	Reference	31.4	Reference	Reference
Some college	25.6	7.0 (4.7, 9.3)	1.17 (0.70, 1.94)	1.09 (0.66, 1.85)	27.2	1.09 (0.65, 1.85)	0.04 (0.60, 181)
Graduated college	42.9	11.0 (8.5, 13.4)	**1.90 (1.22, 2.97)**	1.41 (0.90, 2.21)	41.4	**2.04 (1.30, 3.21)**	1.53 (0.95, 2.46)
Married							
Yes	56.4	11.5 (9.4, 13.6)	**2.92 (1.94, 4.38)**	**1.60 (1.01, 2.52)**	56.4	**3.07 (2.02, 4.65)**	1.48 (0.92, 2.38)
No	43.6	4.3 (2.8, 5.7)	Reference	Reference	43.6	Reference	Reference
Employed							
Yes	54.6	10.1 (8.1, 12.2)	**1.68 (1.16, 2.44)**	1.12 (0.76, 1.65)	52.9	**1.86 (1.27, 2.73)**	1.12 (0.74, 1.70)
No	45.4	6.3 (4.6, 8.0)	Reference	Reference	47.1	Reference	Reference
Had intercourse in past 6 months							

Variable	I. Current case (N=208) [a] versus all other groups (N=2053) II.				II. Current case (N=208) [a] versus Controls (N=1323) [b]		
	%	Prevalence vulvodynia (95% CI) [a]	OR (95% CI)	OR [c]	N	OR (95% CI)	OR [c]
Yes	65.8	11.3 (9.2, 13.4)	**4.22 (2.63, 6.78)**	**2.59 (1.52, 4.42)**	60.6	**5.72 (3.53, 9.28)**	**3.45 (1.98, 6.02)**
No	34.2	2.9 (1.7, 4.2)	Reference	Reference	39.4	Reference	Reference

[a] Current case = current vulvodynia

[b] Control = control without vulvar pain or dyspareunia

[c] Multivariable logistic regression, including age, ethnicity (White, Black, Hispanic, other), Educational level (3 category), married vs. not, employed or not, and having had intercourse in the past 6 months in the model

Table 3

Pain Characteristics Among Women Meeting Criteria for Current Vulvodynia (N=208, weighted data)

Pain characteristics	% (95% CI)
Pain after intercourse	42.4 (34.2, 51.1)
Pain with 1st intercourse	41.7 (33.4, 50.5)
Pain with 1st tampon	23.3 (12.7, 30.9)
Provoked versus unprovoked	
Provoked pain only	64.8 (56.2, 72.5)
Unprovoked pain only (spontaneous)	20.3 (14.3, 28.0)
Mixed pain (includes both provoked and unprovoked)	14.9 (10.0, 21.8)
Impact on intercourse	
Made intercourse impossible	4.4 (2.4, 7.9)
Frequently prevented intercourse	15.1 (10.2, 21.9)
Caused discomfort, but didn't prevent intercourse	72.5 (65.0, 79.0)
Not applicable	8.0 (4.8, 12.9)
Pain descriptors	
Irritating	53.6 (45.2, 61.7)
Burning	51.4 (43.1, 59.6)
Raw	45.0 (37.0, 53.3)
Itchy	27.8 (21.3, 35.4)
Pressure	26.6 (19.0, 36.0)
Sharp	20.8 (15.1, 28.1)
Stabbing	9.1 (5.7, 14.2)
Prickly	8.5 (5.2, 13.6)
Diagnoses given (of 58 women with diagnosis), %	
Lowestrogen	39.5 (25.5, 55.5)
Yeast infection	36.9 (23.5, 52.7)
Stress	11.5 (4.7, 25.2)
Dermatologic disorder	6.1 (1.9, 17.8)
Vulvodynia/vestibulodynia	5.7 (1.6, 18.7)
Psychological	4.5 (1.3, 14.6)
Allergy	1.1 (0.1, 8.2)
Nothing wrong	8.7 (3.1, 22.0)
Other	36.4 (23.2, 52.0)